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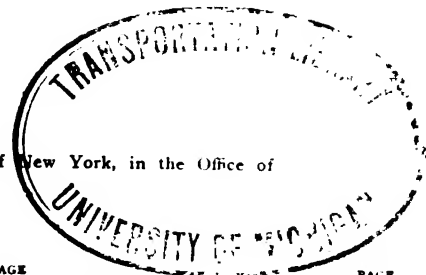
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SPECIAL DEALERS' AND EXPORT NUMBER.

The Hub

APRIL

1900

DEVOTED TO THE DOMESTIC AND FOREIGN INTERESTS OF CARRIAGE, WAGON AND AUTOMOBILE
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Vol. XLII.

No. 1.

TRADE NEWS PUBLISHING CO
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24-26 MURRAY ST. NEW YORK.

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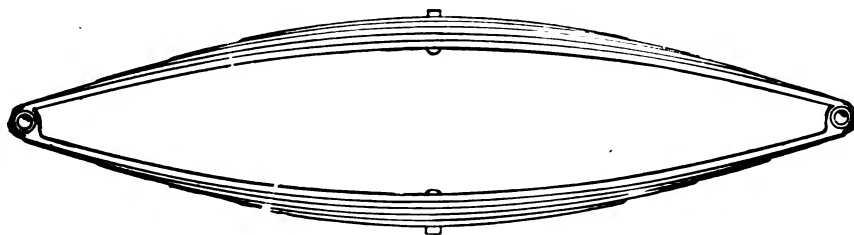


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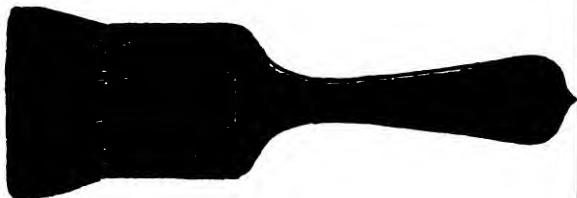
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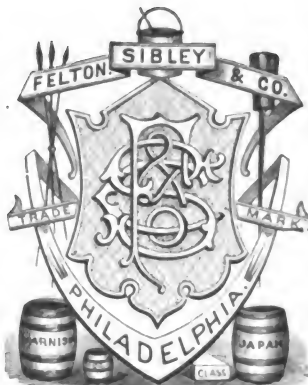
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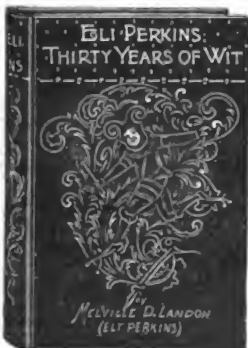
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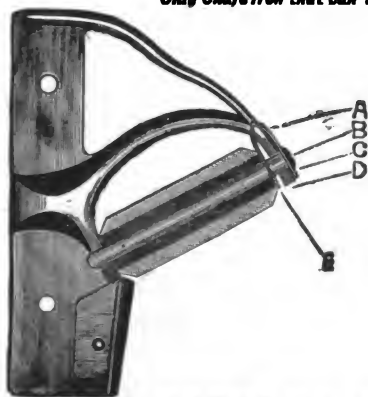
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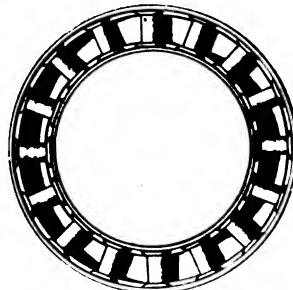
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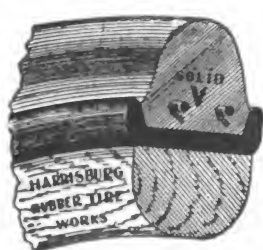


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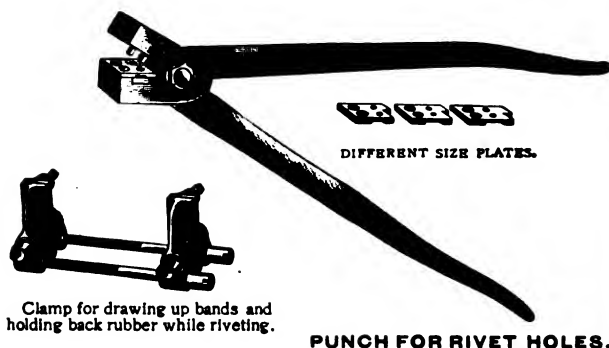
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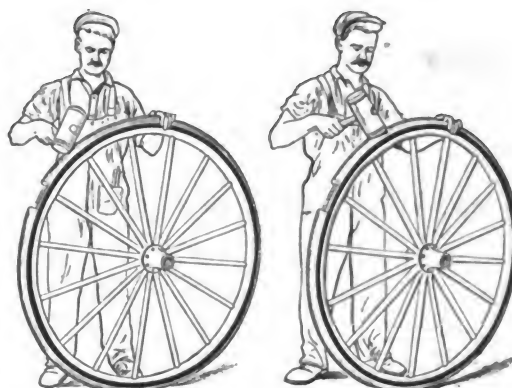


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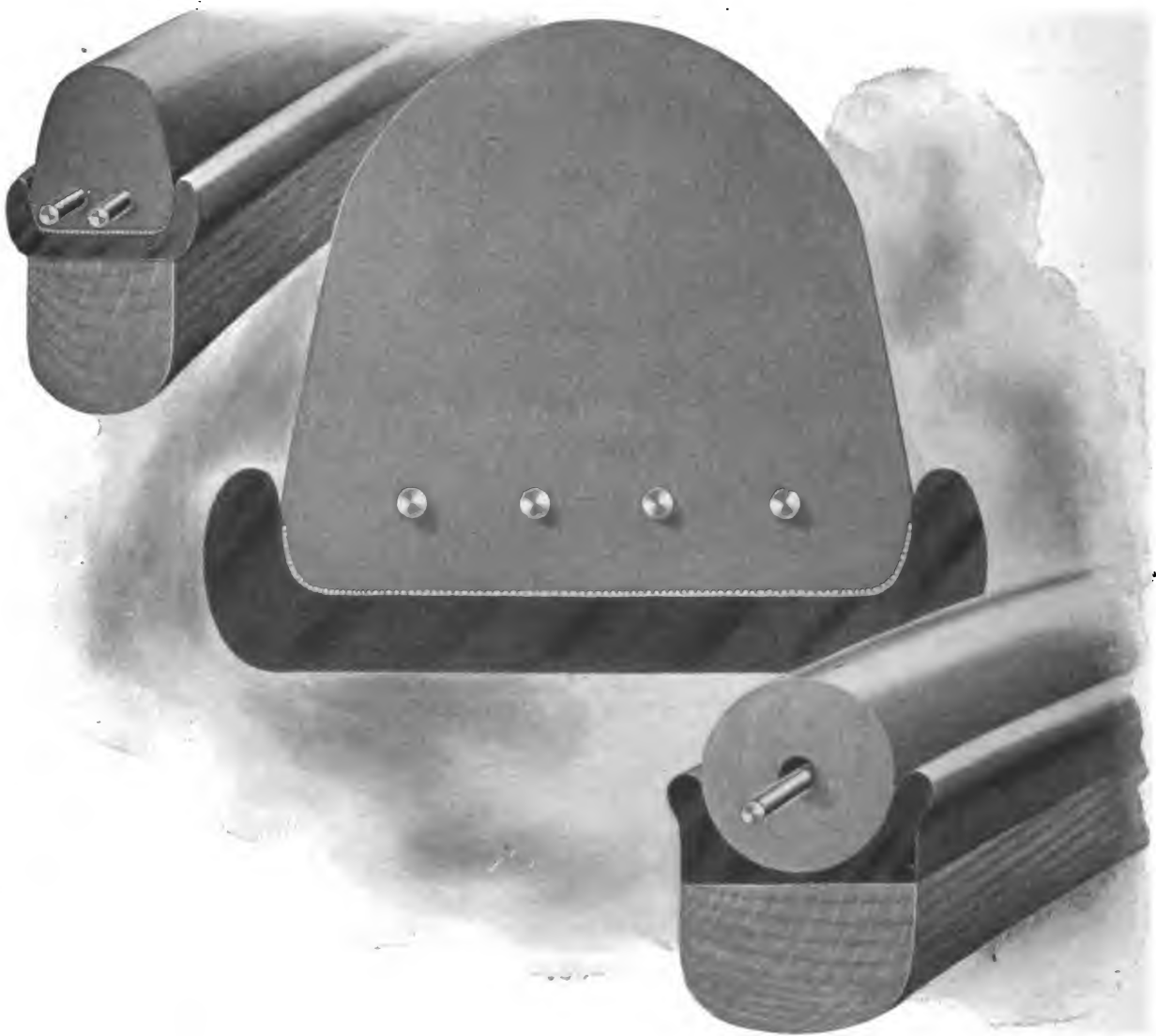
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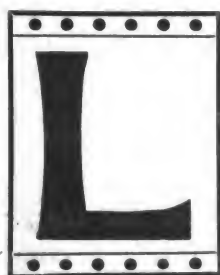
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Send for a small sample section and it will only take YOU four minutes to be convinced. ❖ ❖

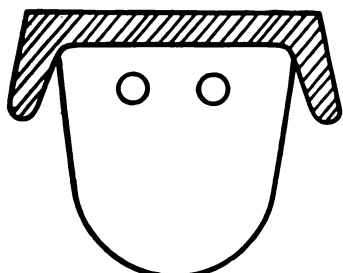
THE RUBBER TIRE CO., INCORPORATED,

Samples shown and contracts made only by
LATTA & MULCONROY,
1215 Market St., Philadelphia, Pa.

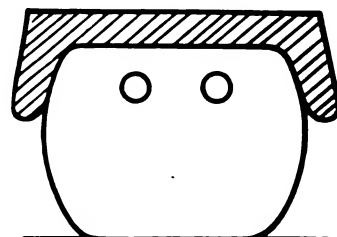
PHILADELPHIA, PA., U. S. A.

Langmuir's Patent Improved Solid Rubber

CARRIAGE TIRE



NORMAL



UNDER LOAD

This tire does not open at the joint and consequently it does not require compression; does not creep; does not cut out at the

base; does not split or scalp; all on account of the V-shaped space between the tire and the flanges. We supply the trade with all sizes from $\frac{3}{4}$ to 2 inches inclusive. We furnish a complete outfit for applying all sizes, $\frac{3}{4}$ to 2 inches.

PUT THEM ON IN YOUR SHOP IN THE REGULAR CHANNEL IRON IN USE

REVERE RUBBER CO.

Sole Manufacturers, 59 & 61 Reade St., New York



This Trade Mark

Is a Safe Insurance of Quality!

Hartford Carriage Tires

Are Built to Stand Up in Carriage Service and Can Be
Depended on to Do So.

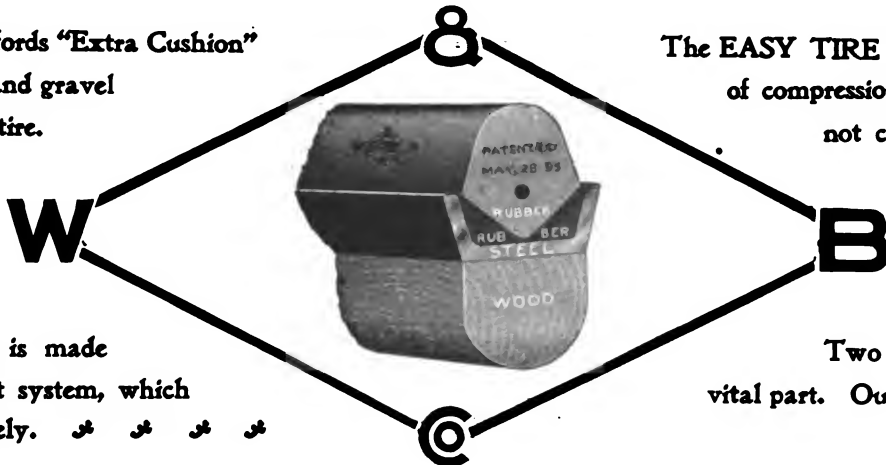
...THE....

HARTFORD RUBBER WORKS CO.,
HARTFORD, CONN.

EASY RUBBER VEHICLE TIRES.

The rubber base affords "Extra Cushion" and prevents sand and gravel working under the tire.

The EASY TIRE has a large amount of compression, is elastic and will not creep in the channel.



The EASY TIRE is made under the two-part system, which we control exclusively. * * *

Two wires weaken the vital part. Our one wire does not.

Results in Service during past years have demonstrated the intrinsic value of the EASY TIRE.

Send for our latest proposition for applying Easy Tires in your own factory.

MANUFACTURED ONLY BY

THE WHITMAN & BARNES MFG. CO.,

GENERAL OFFICE: AKRON, OHIO. FACTORIES: AKRON, OHIO; CHICAGO, ILL.

STORES AND WAREHOUSES:

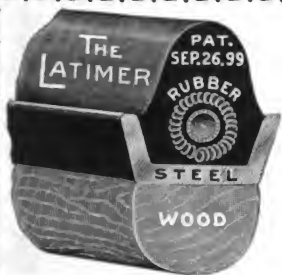
NEW YORK, 111 Chambers St. and 1788 Broadway.
BOSTON, 23 and 25 Pearl St.
SYRACUSE, N. Y.

CINCINNATI, 212 and 214 E. 8th St.
CHICAGO, 267 Wabash Ave. and 120th St.
KANSAS CITY, 1224 and 1226 W. 11th St.

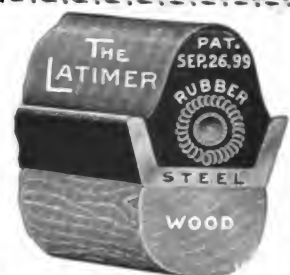
LONDON, ENGLAND, 149 Queen Victoria St.
PARIS, FRANCE, 166 Boulevard de la Villette.

LICENSEES IN ALL THE PRINCIPAL CITIES.

We are also manufacturers of SPECIAL MOULDED AND MECHANICAL RUBBER GOODS.



RESILIENT COMPOUND STEEL SPRING VEHICLE TIRES.



After a test of one year and a half we are pleased to place this Tire before the people. This Tire will take the place of pneumatic tires for vehicles as well as solid rubber tires. It is more resilient than hard rubber, therefore will stand more wear. It will not crack off at the top of the channel like solid rubber tires, as the Compound Steel Springs will keep the rubber from cracking at that point. The two coils of wire are in telescopic (or tubular) engagement with each other and embedded in a body of rubber at a very high pressure, so as to form a solid mass of rubber and springs. We use one wire to fasten the tire to the channel which runs through centre hole. The ends of wire are brazed and the wire drawn tight on bottom of coiled spring gives wide bearing footing and makes it impossible for tire to rock.



WIRE PULLER.

With this Puller, which we furnish, a Plumbers' Blow Torch and Vise, any ordinary mechanic can set our tires.

THE LATIMER RUBBER TIRE CO.

CHICAGO,

24 South Clinton Street.

NEW YORK,

15 Platt Street.

WORKS, HUNTLEY, ILL.



Please mention "The Hub" when you write.

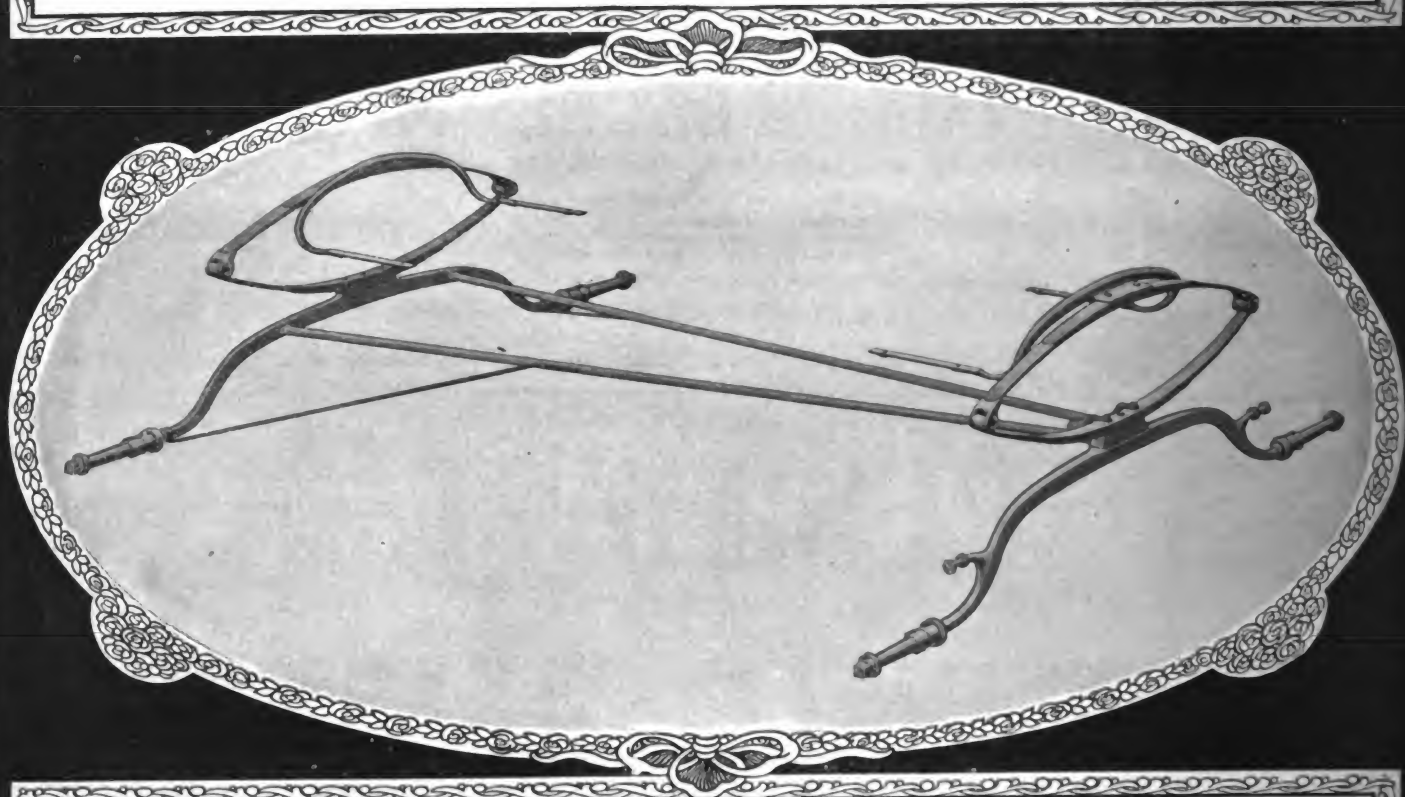
THE BUFFALO SPRING & GEAR CO.'S NEW BIKE GEAR.

SOLID FORGED REACH CONNECTIONS.

(NOT BRAZED OR WELDED.)

SOLID FORGED SHAFT HANGERS.


(NOT BRAZED OR WELDED.)

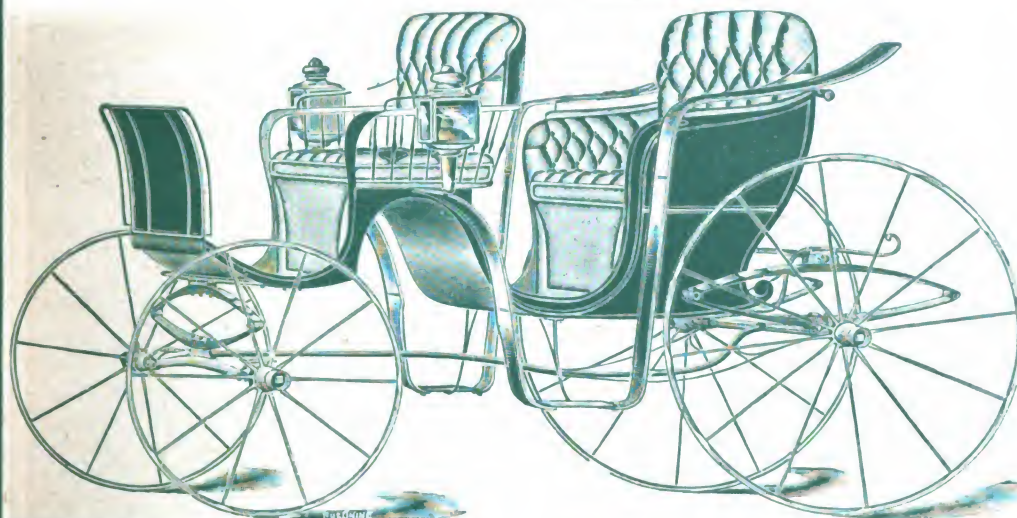
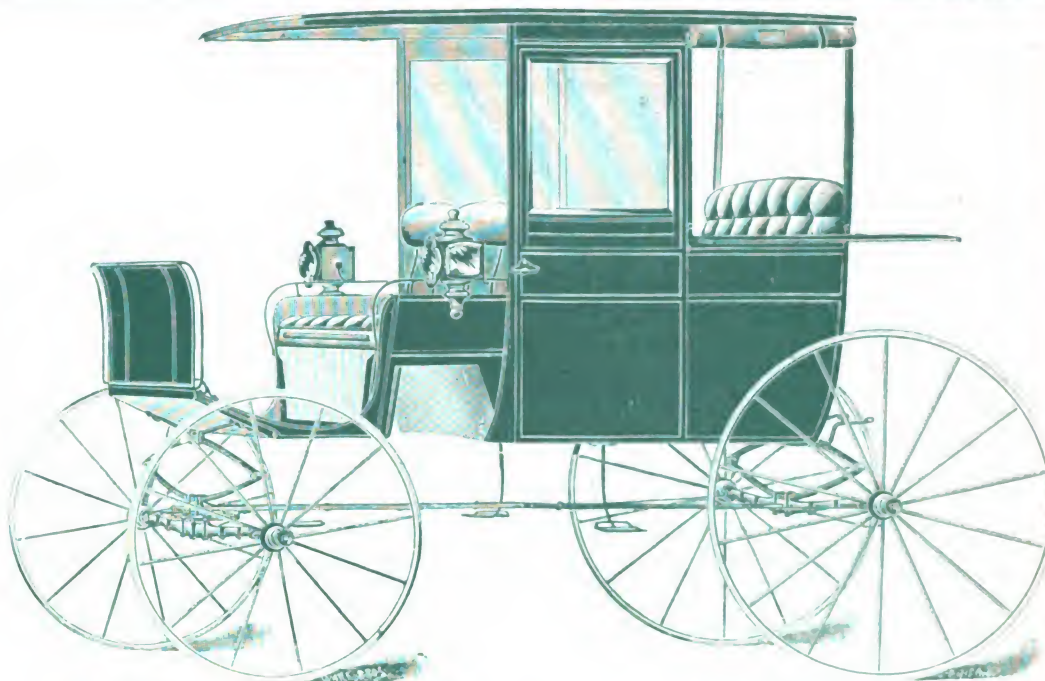


From now on you can have these desirable features on every Buffalo Bike wagon. These improvements cost *us* a lot of money, but they will not cost *you* a cent extra. They make the Buffalo Bike Wagon far superior to any other similar vehicle at any price. They will help you to make money. We can furnish the above gears with wood wheels and solid rubber tire, or wire wheels, with pneumatic Tires. Our prices on Bike Wagons and other vehicles in the white are very attractive. Write for them.

THE BUFFALO SPRING & GEAR CO.,

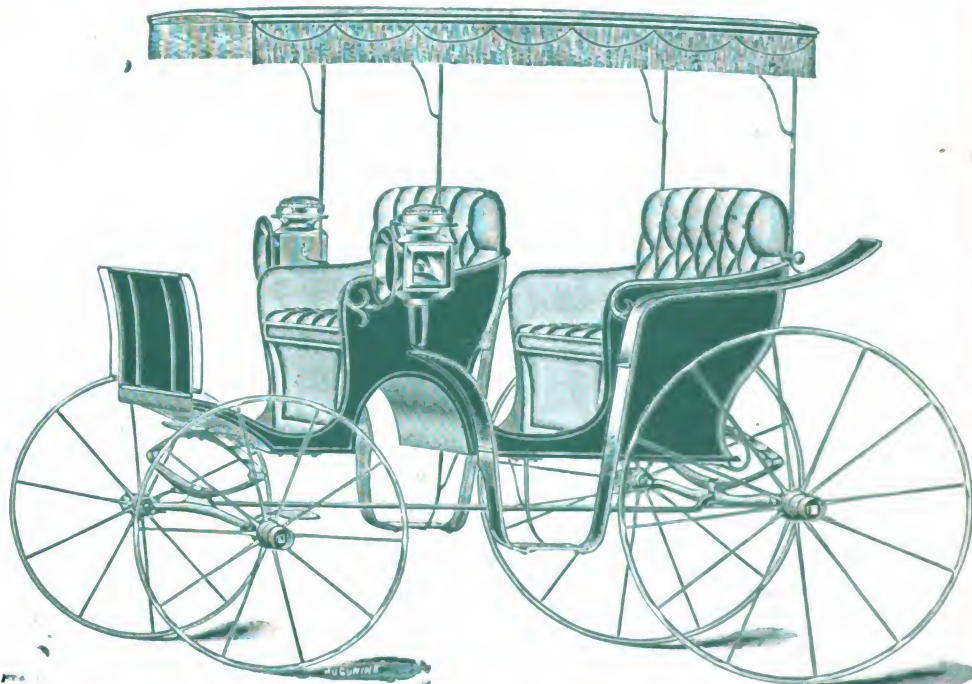
 **BUFFALO, N. Y.**

H. H. 
BABCOCK
COMPANY.



WOULD LIKE TO
SEND THEIR NEW
CATALOGUE TO
ALL DEALERS
WHO HAVE NOT
RECEIVED ONE.

WHEN YOU SELL
A BABCOCK VE-
HICLE YOU ARE
ALWAYS SURE
OF PLEASING
YOUR CUSTOM-
ER. ❧ ❧ ❧ ❧



H. H. BABCOCK COMPANY, Fine Carriage Builders,
WATERTOWN, N. Y.

Waterloo Pneumatics.

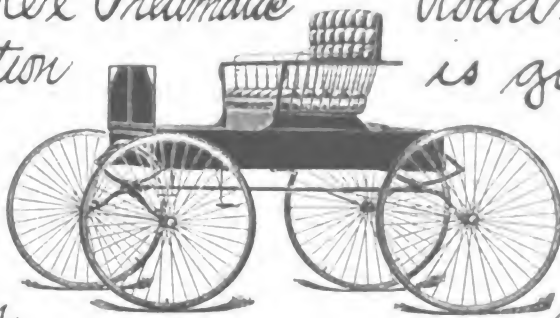
To The Trade;—

The subject of "Pneumatics" has commanded the earnest attention of progressive carriage builders and dealers during the past season to a remarkable degree.

The conclusion reached by both is that, to be a permanent success, Pneumatic Vehicles must be constructed of the best material, honestly put together.

It is just this combination that we are offering to the dealer who appreciates a good looker, a good seller and a good laster in a Pneumatic.

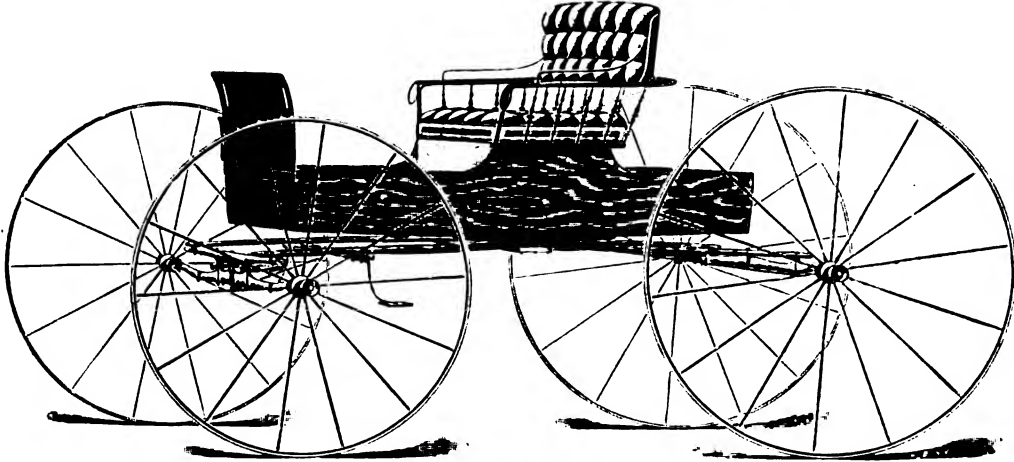
In The Rex Pneumatic Road Wagon, shown herewith full appreciation of first impressions its unusually pleasing proportion this is the recognition lying principle that lasting friendship is, above all, due to good wearing qualities—nothing but the very best of material is used in any part of this vehicle and it is sold on this guarantee.



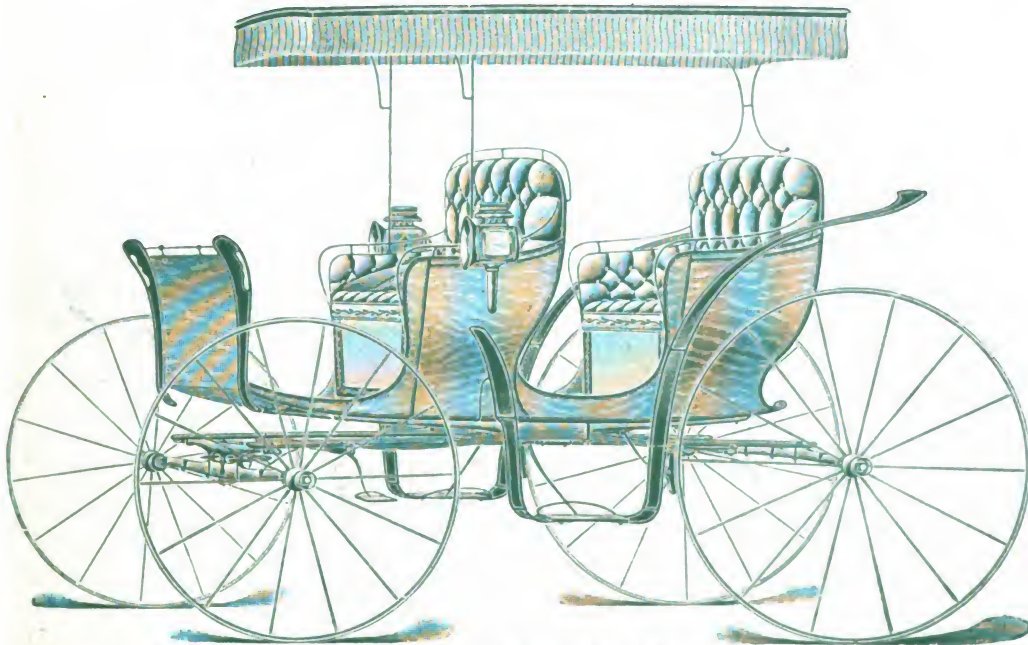
Its price, quality considered, is also very attractive, and we solicit correspondence from prospective buyers believing that the intrinsic merit in the "Rex" will win.

Waterloo Wagon Company Ltd.
Waterloo, N.Y.

In the Construction of Our
GLENS FALLS BUCKBOARD VEHICLES



No. 430. NEWPORT ROAD WAGON BUCKBOARD.—Glens Falls Gear.



No. 445. CARLSBAD CURRICLE BUCKBOARD.—Glens Falls Gear.

WE AIM:

First - AT DESIGN. Our designs are prepared with an eye to artistic proportion, combined with comfort.

Second - AT QUALITY OF MATERIAL. We use nothing therein that is not of the Very Highest Grade.

Third - AT WORKMANSHIP. We employ in their construction none but the highest class of workmen, experienced in Buckboard building.

Fourth - AT FINISH. We finish these Vehicles in such a manner that they are not only beautiful when new, but they will grow old gracefully, taking on with age those rich tones and colorings so pleasing to the artistic eye.

Fifth - AT EQUIPMENT. Judged by the most critical and exacting standards, our equipment for comfort and convenience is complete in every detail.

Sixth - AT PRICE. Our price is as low as it is possible to offer an absolutely high grade Buckboard.

Correspondence Solicited.

WATERLOO WAGON CO., Limited,
WATERLOO, SENECA COUNTY, N. Y., U. S. A.

Please mention "The Hub" when you write.

The Value of Selling Points

IS WELL-KNOWN TO THE WIDEAWAKE DEALER WHO WANTS TO INCREASE THE VOLUME OF HIS BUSINESS. Our line of vehicles is full of these features which most readily convince the buyer that he is getting full value for the money he is investing.

STAYER SELF-OILING DUST-PROOF AXLE. Light running, perfectly adjusted to any thickness of washer by set screw in axle-nut—excludes the dust and retains the oil.

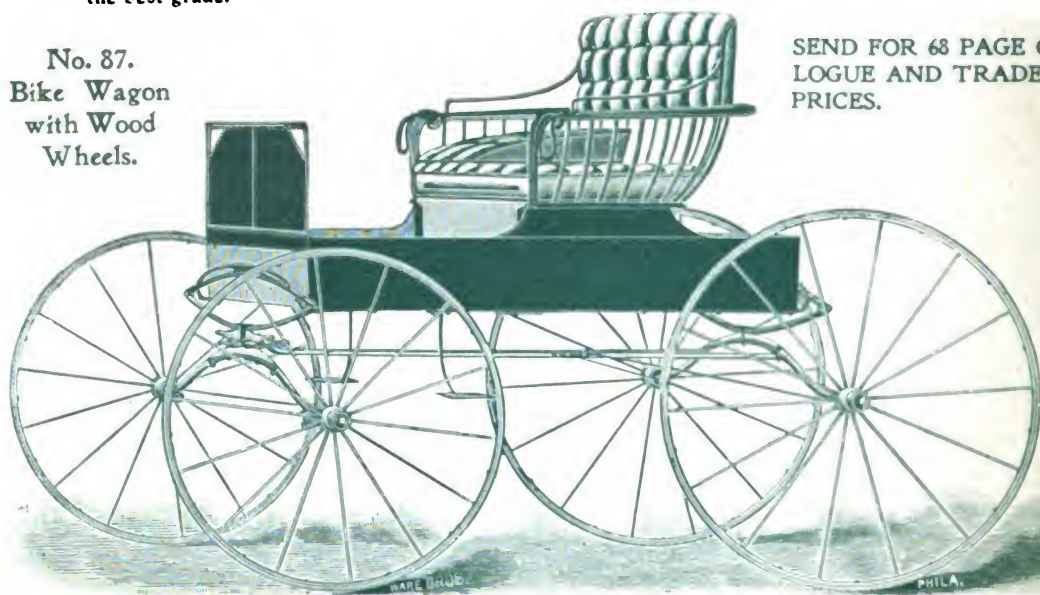
PERFECTLY IRONED OBARS. Norway iron stays and braces, full ironed reaches, full length steel forged body loops, double lipped. Solid foot dash. Beds cemented to axles.

OPEN SPRING CUSHION, made under our own patents. Springs retain their position and elasticity no matter how long they are used.

OUR OWN CONSTRUCTION. We build our own bodies, seats, gears, our own poles and shafts, forgings, dashes, fenders; employing skilled labor and the use of our own patents and designs.

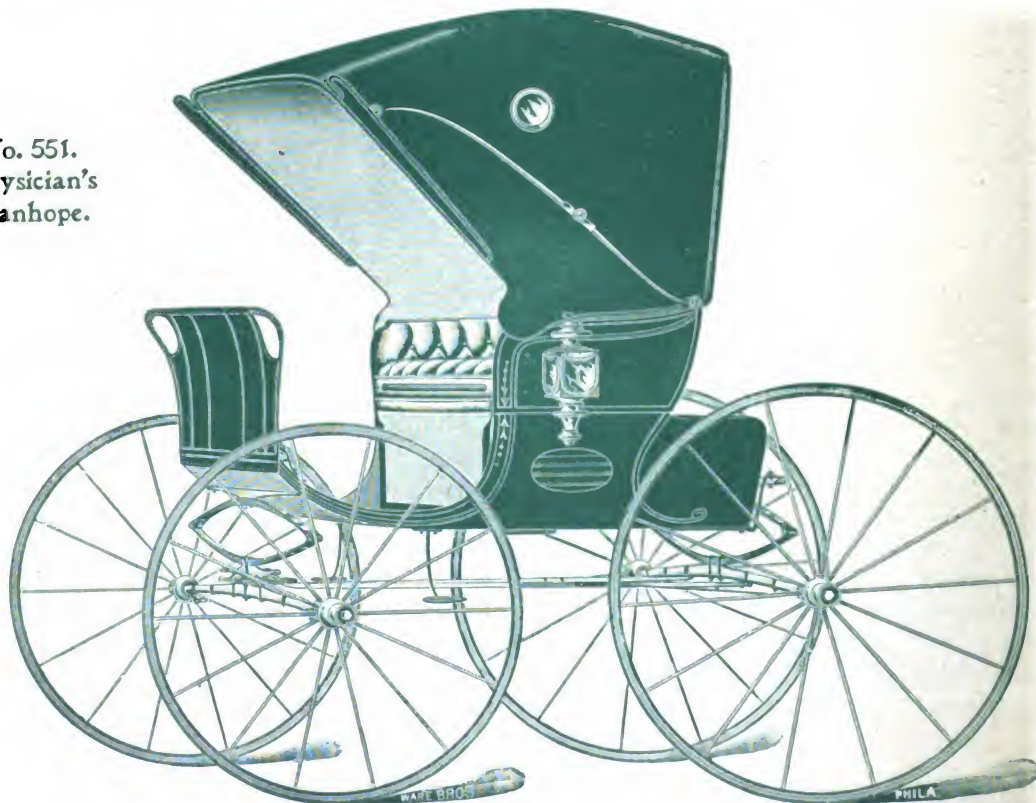
FINISH. Special attention is given to a fine finish. Our work is attractive in style. The painting and trimming are of the best grade.

No. 87.
Bike Wagon
with Wood
Wheels.



SEND FOR 68 PAGE CATALOGUE AND TRADE PRICES.

No. 551.
Physician's
Stanhope.

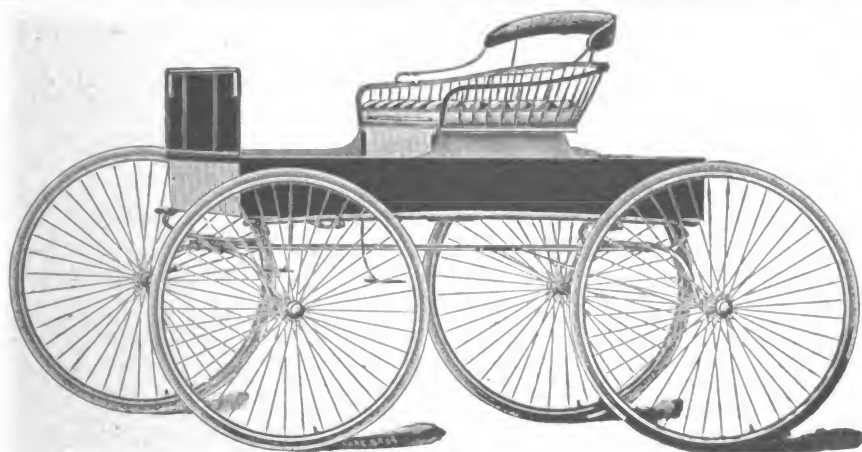


STAYER CARRIAGE CO., 76th and WALLACE STS.,
CHICAGO.

WANTED

Live, Up-to-Date Dealers to Handle

THE BEST LINE OF **WAGONS** MANUFACTURED.

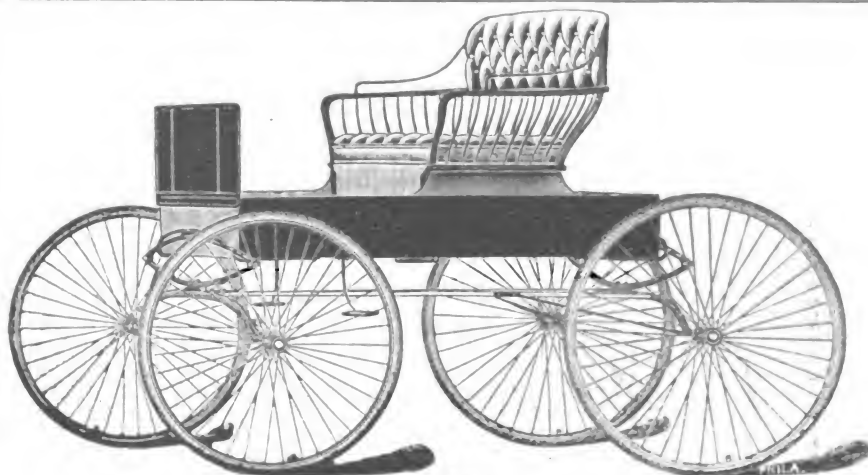


No. 50.

Gentlemen's Light Road Wagon or Speeder.



➡ **THE STIVERS GEAR A SPECIALTY.** ➡



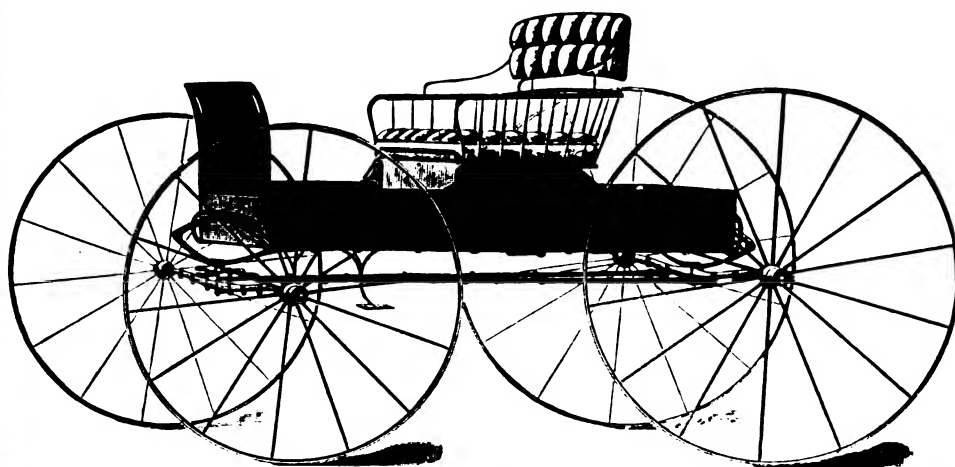
No. 80.

End Spring Pneumatic Runabout.

WRITE FOR CATALOGUE, TERMS, ETC.

G. W. & H. D. CRAWFORD CO.
DELHI, N. Y.

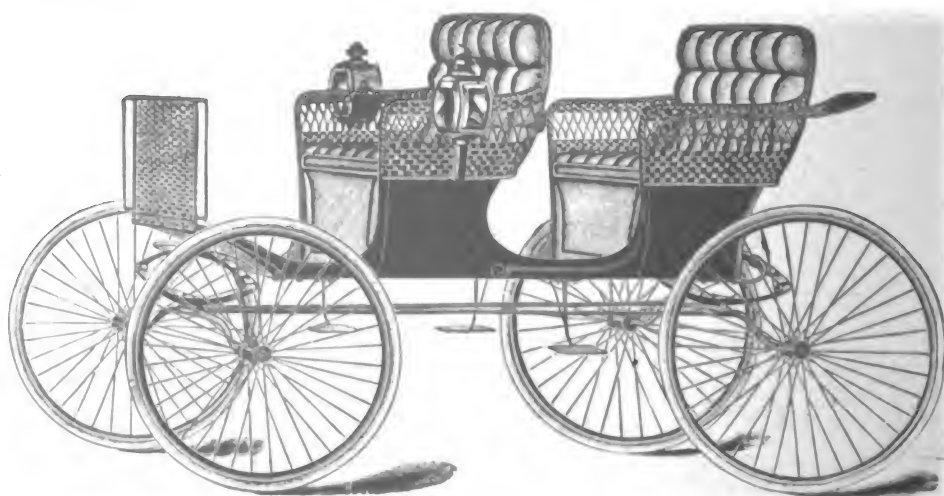
•• The Best ••



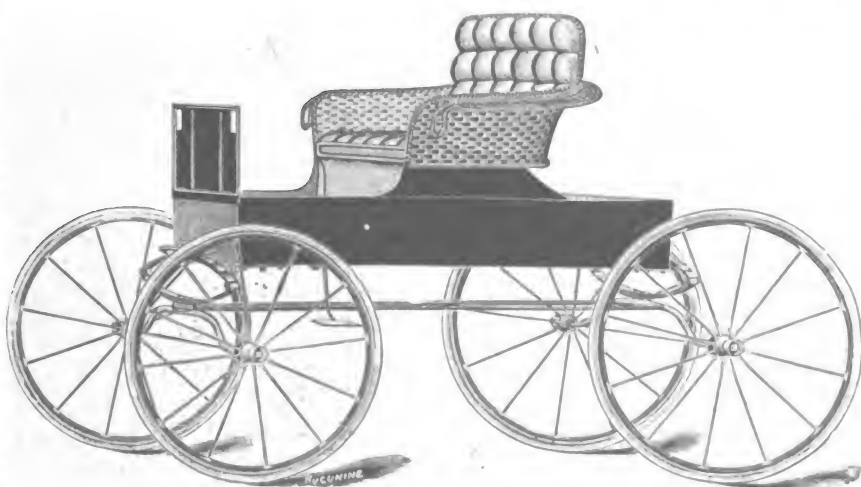
No. 199.

*Good Material and
Fine Workmanship
are what we claim
for every job man-
ufactured by us. •*

*Our Pneumatic
Tires are
Guaranteed.*



No. 68.



No. 50.

*Send for 1900
Catalogue and
Prices.*

Birdsall, Waite & Perry Mfg. Co.

SHORT & MILBURN,
1665 Broadway, NEW YORK,
EASTERN SALES AGENTS.

WHITNEY'S POINT, N. Y.



T. H. H. MESSINGER,

Designer and Builder of

**FINE CARRIAGES
AND WAGONS,**

**611 WEST FRONT STREET,
WILMINGTON, DEL.**

Best in the Market ➤

We build
Honest Wagons
at
Honest Prices.



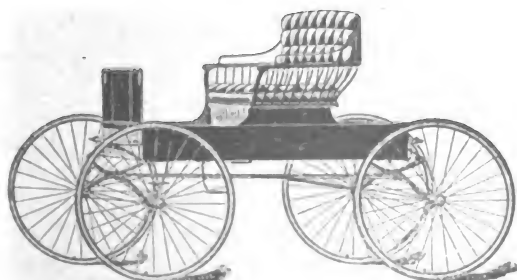
No. 35

.....WRITE FOR OUR ILLUSTRATED CATALOGUE AND PRICE LIST.....

THE O. ARMLEDER CO.,

Cincinnati, Ohio.

THE FAMOUS RUBINSTEINS.

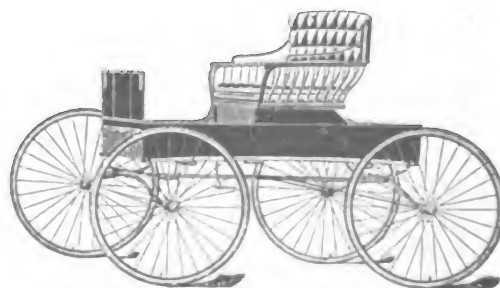


STRICTLY HIGH GRADE.

SURE SELLERS.

TRADE WINNERS.

1900 Catalogue Illustrates Our
Full Line.



RICHLAND VEHICLE CO.,

(Successors to RICHLAND BUGGY CO.)

MANSFIELD, OHIO.

COLUMBUS BUGGY CO.

**COLUMBUS, OHIO,
MANUFACTURERS OF**

HIGH GRADE VEHICLES ONLY.

DEALERS WHO ARE WIDE AWAKE TO THEIR OWN INTEREST SHOULD NOW BE WITHOUT COLUMBUS BUGGY CO.'S VEHICLES. NO REPOSITORY IS COMPLETE WITHOUT THEM. THEY ARE STANDARD THE WORLD OVER. THE NAME GUARANTEES THE QUALITY. WE HAVE MANY NEW AND ELEGANT DESIGNS FOR 1900. GOOD SELLERS.

WRITE FOR OUR NEW CATALOGUE

**We Build the Finest Line of
Traps, Cut-unders and
Straight Sills on the Market.**



No. 27 PARK VIEW TRAP (Patented.)
Showing same as two seated.

**Our side opening Traps are the
best. Easy to open, and the Lamps
are always in upright position.**

Runabouts with Pneumatic and Common
Wheels. Carts for Domestic Use and
Export a specialty.

J. T. CLARKSON & CO.
AMESBURY, MASS.

Want Something Good?

*Good things usually come high, but then some articles
are sold at fancy prices. We are satisfied with a
reasonable profit and put honest value in all our wagons.*



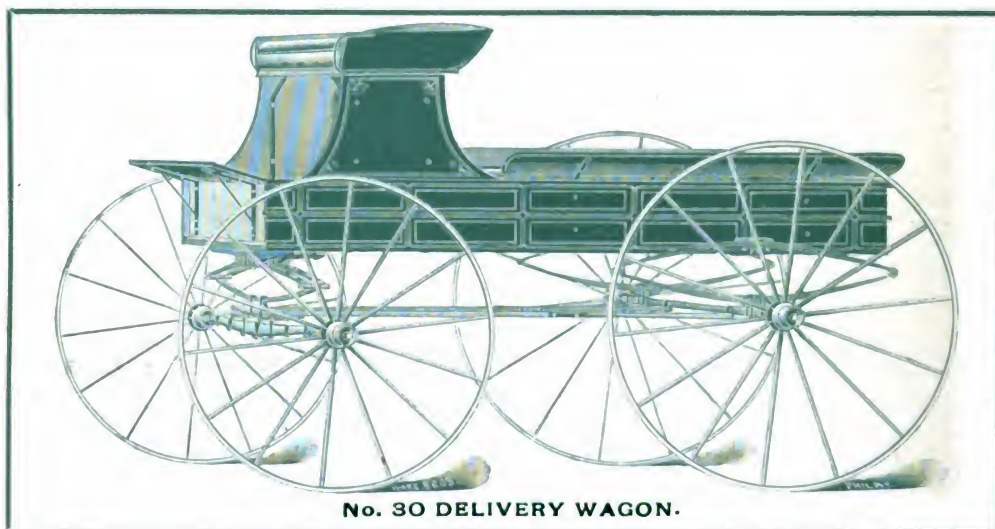
*Our wagons are good wagons to handle because of their
catchy design, attractive finish and price.*

MR. DEALER: We are after you and that
for your good. Write and see if you don't
agree with us.

ANCHOR SPRING WAGON WORKS,
ELIZABETHTOWN, PA.

AN IDEAL LINE OF Spring Wagons for the Dealer.

Carrying
Capacity,
1,100 pounds.



No. 30 DELIVERY WAGON.

Well Finished.
Strongly Built.

WE WILL SEND YOU A CATALOGUE IF YOU DESIRE IT.

THE GALION WAGON & GEAR CO.
GALION, OHIO.

OUR WAY. * * *

* * * OTHERS' WAY.



E. L. BOWLES, 124 Chambers Street, New York City.
F. M. LETTS, 31 North Sixth Street, Philadelphia, Penn.
W. H. CHEEVER, Cor. Sudbury and Portland Sts., Boston, Mass.
CHAS. G. JOHNSTON, 317 Central Union Block,
Madison and Market Streets, Chicago.

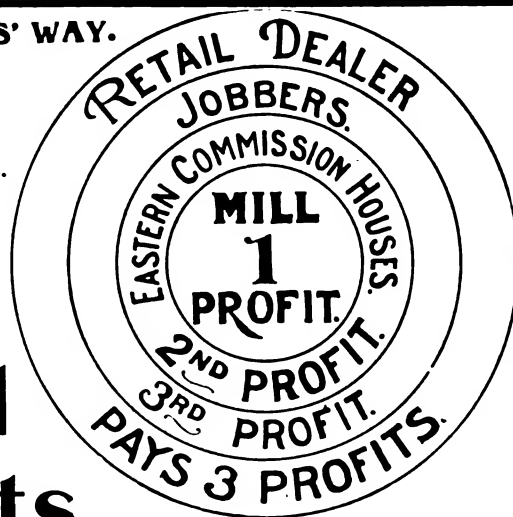














We are the
only people
who make

The Genuine Wool Square Horse Blankets.

ECLIPSE, MONITOR, ZERO, DEXTER,
EXPRESS, GUY, J. I. C., TRUCKEE,
GREENLAND AND GOLDEN FLEECE
FAWN. * * *

**Northern Ohio Blanket Mills,
The Beckman Co.,
Cleveland, Ohio. * * ***

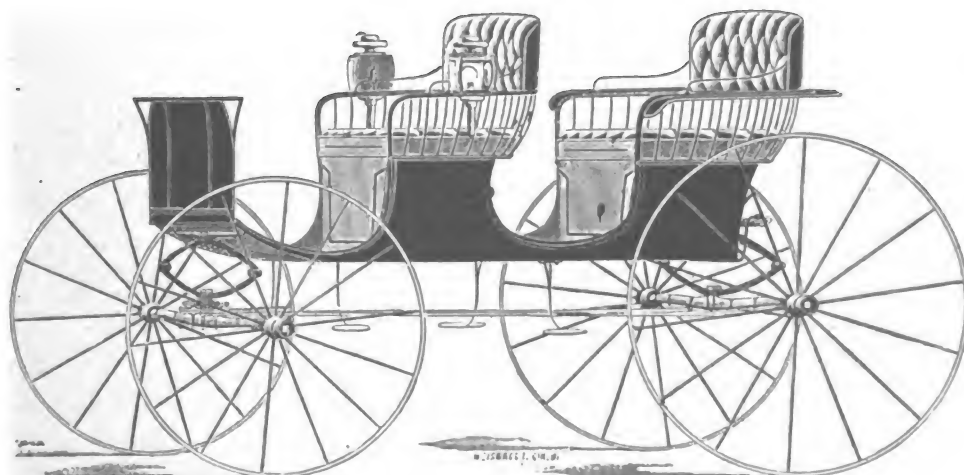


They are not sold to Jobbers, Dry Goods,
Catalogue or Department Houses.....
Many Jobbers in the past year adopted
the above style names, imitated the
patterns and sold inferior grades, either
as ours, or as good as ours.... It is
a fraudulent practice... Retailers can
buy the Genuine      
Blankets from us only      
From Mill Direct to Retailer.

The Monarch Vehicle Co.

COLUMBUS, OHIO.

Beautifully
Trimmed.



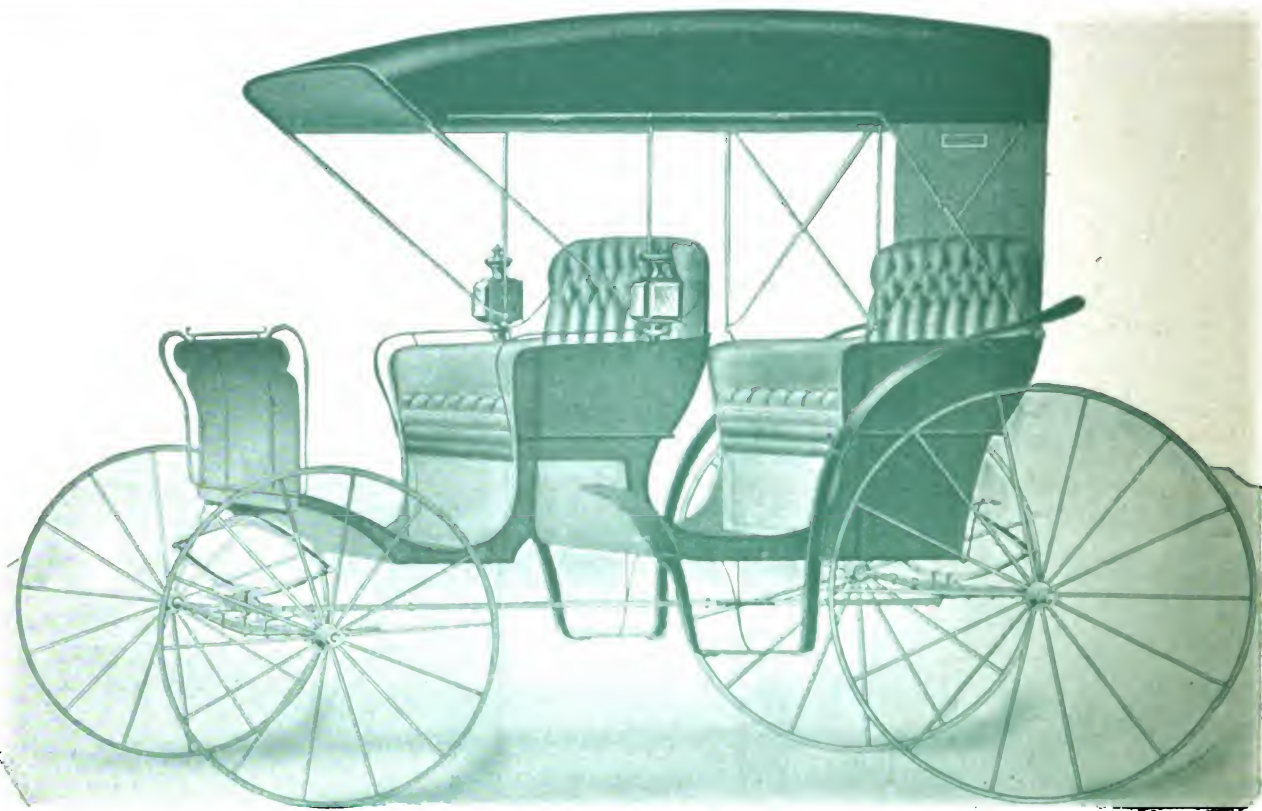
Quick
Sellers.

No. 101—STICK SEAT OPEN SURREY.

MANUFACTURERS OF

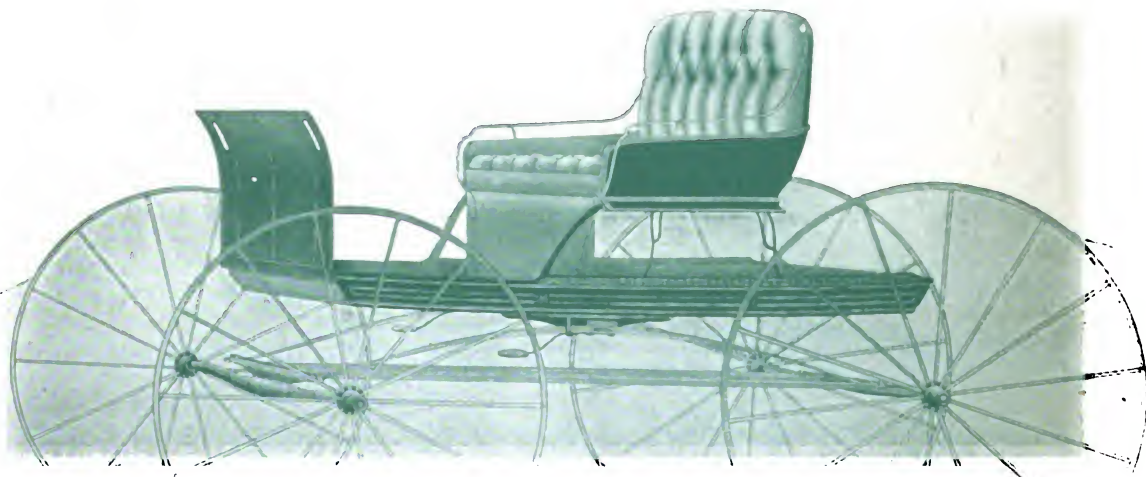
Buggies, Phaetons, Runabouts and Surreys.

Please mention "The Hub" when you write.



No. 286. JEWEL EXTENSION TOP SURREY.

JEWEL CARRIAGE CO.



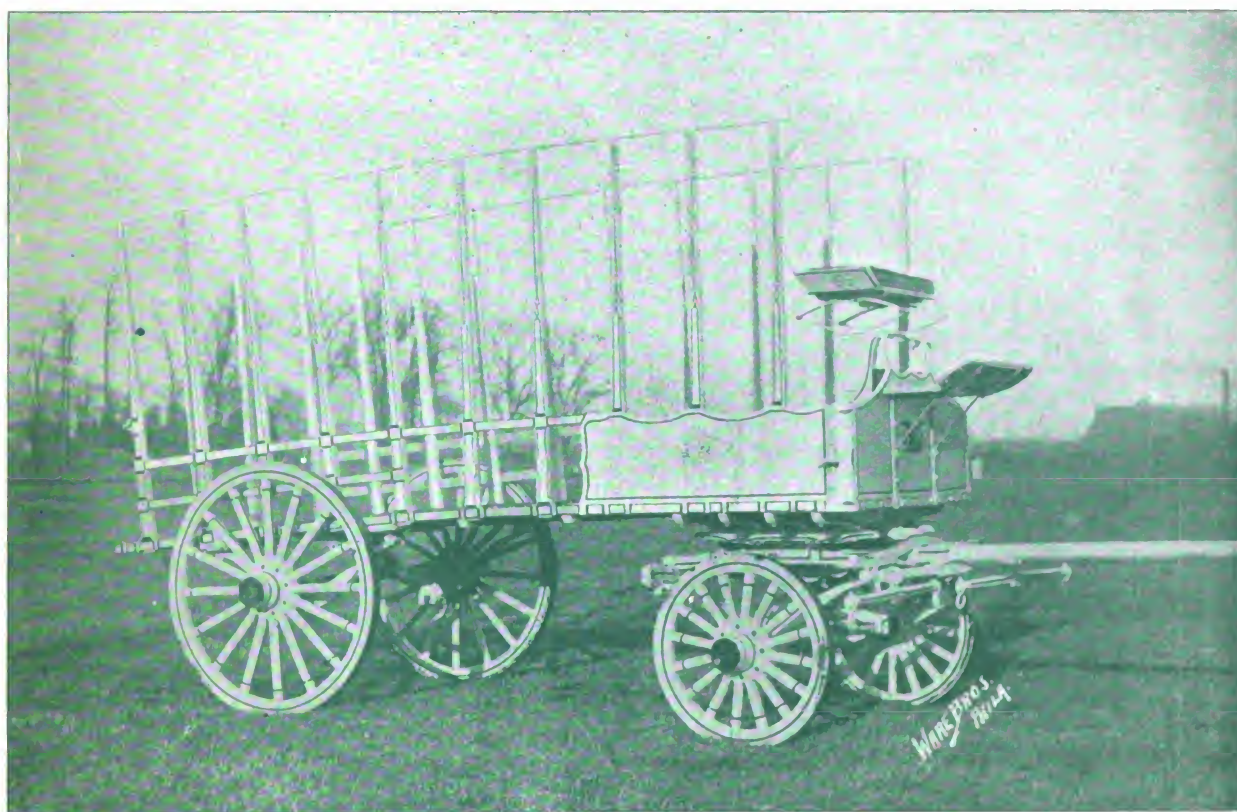
No. 245. OPEN CONCORD WAGON.

Our elegant new art catalogue fully describes the many good qualities of the above two vehicles, and also many other styles that will interest every up-to-date dealer who is desirous of serving his trade with the latest and best vehicles the market affords. Be sure and send for our prices before buying. You will find them astonishingly low on such high-grade goods. * *

JEWEL CARRIAGE CO., **CARTHAGE,**
OHIO.

TERRE HAUTE

is surrounded with Ash, Hickory, Iron,
Steel and Coal



TERRE HAUTE CARRIAGE AND BUGGY CO.

Builds United States Screen Mail Wagons,
the New Rural Mail Vans, the New Phila-
delphia Postal Carts, and all Brewers' and
Wholesalers' High-Grade Spring Trucks. . . .

TERRE HAUTE, . . . INDIANA, U. S. A.

NEW YORK,
302-308 West 53d Street.

PHILADELPHIA,
12th and Locust Streets.

Please mention "The Hub" when you write.

Another of our Specialties—

No. 90

DOCTORS'

PHAETON

"STANHOPE."

It is impossible to do this vehicle justice with an illustration, it being complete to the minutest detail, and is constructed with an eye single to the wants of the physician. We have equipped it with every convenience for his comfort and it is easy of ingress and exit. In all a very attractive and up-to-date carriage, and like all our specialties sells almost on sight.



No. 90.—Doctors' Phaeton "Stanhope."

Dealers!

We would like to interest you in some of our specialties. Let us send you our catalogue and prices. Dealers handling our Carriage not only make quick sale but also make money.

THE **YOUNGSTOWN** CARRIAGE & WAGON CO.,

YOUNGSTOWN, OHIO.

A large variety of BUGGIES, SURRIES, PHAETONS and ROAD WAGONS always on hand. Orders promptly shipped.

ESTABLISHED 1850.

KETTERER MANUFACTURING COMPANY.

WHOLESALE MANUFACTURERS OF

Strictly
:: *High-Grade*
DELIVERY
WAGONS



Novelties

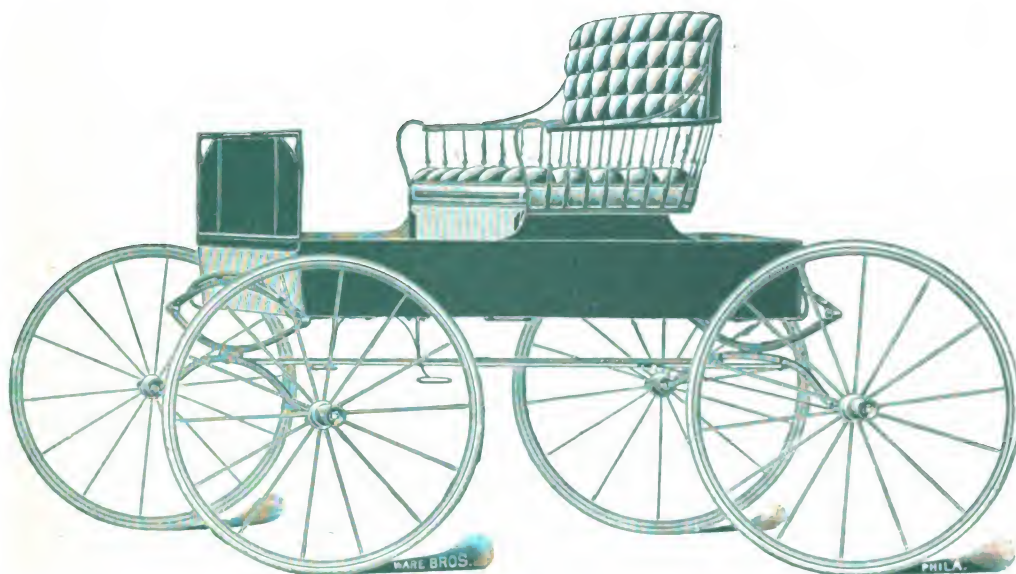
in Delivery Wagons to order, our Specialty.

HANOVER (YORK CO.), PA., U. S. A.

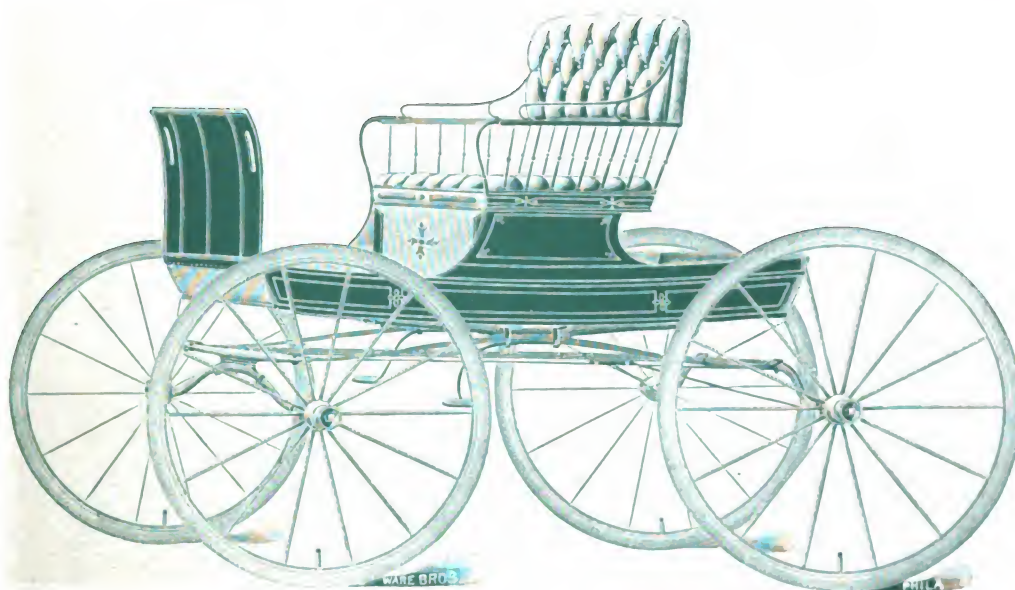
Please mention "The Hub" when you write.

It's a Beauty

AND WILL SELL ITSELF—LOW PRICE, STYLE, COMFORT AND FINISH—ALL THE NECESSARY ELEMENTS in a READY SELLER.



No. 105. Runabout. Wood Wheel, Hard Rubber Tire. Can furnish also with Pneumatic Tire.



No. 32. Lexington Concord. Pneumatic Tire.

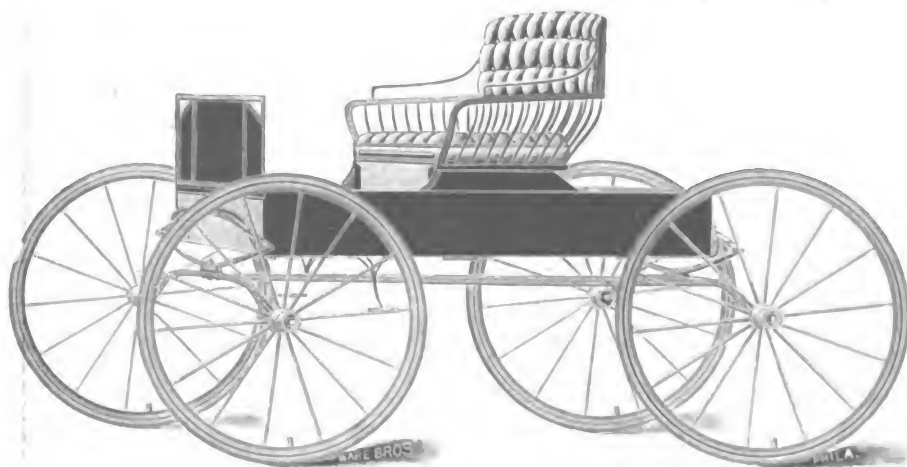
No longer an experiment, but a pronounced success—is the verdict of the dealer regarding our Concords this year. ♣ ♣ ♣ ♣ ♣ ♣ ♣
Western Amesbury goods, made by PONTIAC BUGGY COMPANY, are surely in the foreground to-day. Give us a call. ♣ ♣ ♣ ♣ ♣



Pontiac Buggy Company,

PONTIAC, MICH.

Please mention "The Hub" when you write.



PNEUMATIC RUNABOUT, No. 200.

**BUILDERS OF HIGH GRADE
RUNABOUTS,
PNEUMATIC SURREYS,
BUSINESS WAGONS,
MILK AND DELIVERY
WAGONS**

FINISH AND WORKMANSHIP GUARANTEED.

Our No. 200 runabout body, 24 in.
x 58 in., trimmed with all wool whip-
cord, the very highest art in style.
Write for catalogue.

HOMER WAGON CO.,
HOMER, N. Y., U. S. A.

ATTENTION DRAUGHTSMEN !

**WE OFFER \$300.00 FOR THE BEST NEW DESIGNS OF
Straight-sill Surrey, Ladies' Phaeton and Piano Box Body and Seat,
OR \$100.00 FOR EITHER ONE.**

These designs must present new and attractive features, must be simple in construction for economical building in large body factory (stick seats not wanted). Working drawings will be required of successful designer.

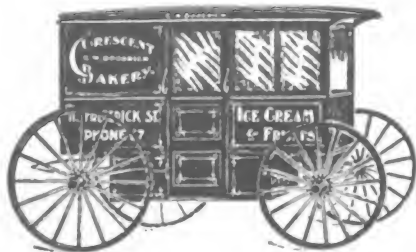
Competition closes June 1st, 1900. Successful designs to become our exclusive property. Payment will be made and unsuccessful designs returned July 1st.

Privilege reserved to reject any or all designs offered.

For evidence of good faith we refer to Hub Publishing Co.

SECHLER & COMPANY. Carriage Builders, Cincinnati, Ohio.

Our low down ball bearing, short turn
MILK and **BAKERY** Wagons are giving
universal satisfaction.



They have the finish, material and all the
good points necessary to make them so.
Write for **PRICES** and **BUSINESS WAGON
CATALOGUE.**

WINKLER BROS.

SOUTH BEND, INDIANA

WINKLER BROS.

SOUTH BEND, IND.



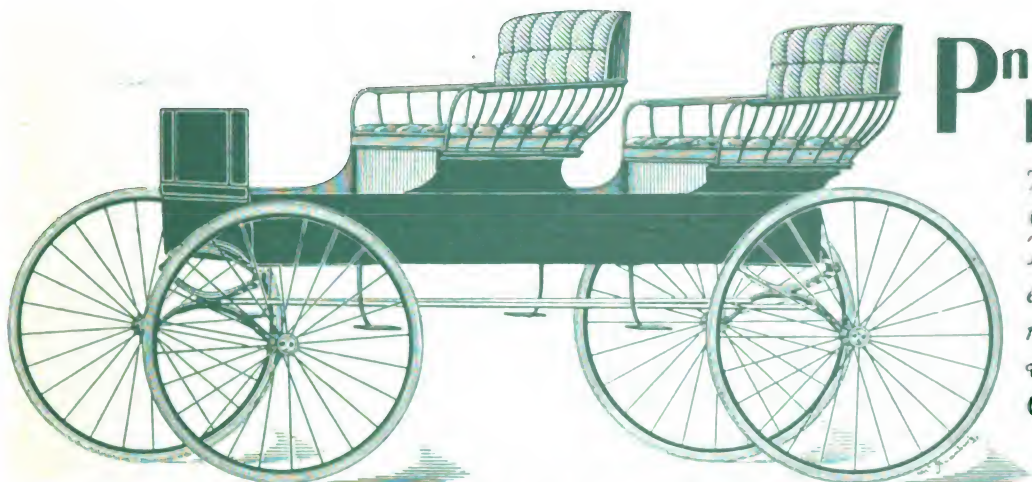
The famous WINKLER PATENT **SPRINKLING
WAGONS.**

**BEST MADE.
LIGHT DRAFT.
EASY OF ACTION.**

Made in different sizes and styles of Gears.

SEND FOR OUR CATALOGUE OF SPRINKLING WAGONS.

THE STYLE AND PRICE THAT SELLS.



Pneumatic Runabout...

with either Bailey or Cane Seat, hung on Bailey Gear, with either Hartford or Diamond Tires, Trimmed with Whip or Bedford Cord or Cloth.



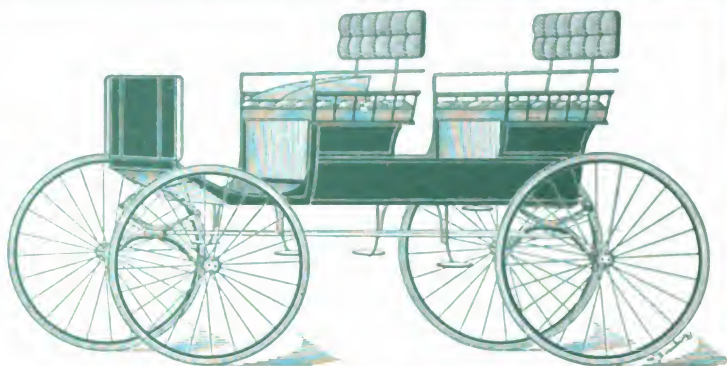
JOHN H. SHIELDS & CO., AMESBURY, MASS.

FOLGER & DRUMMOND,

AMESBURY, MASS.

MAKERS OF HIGH GRADE

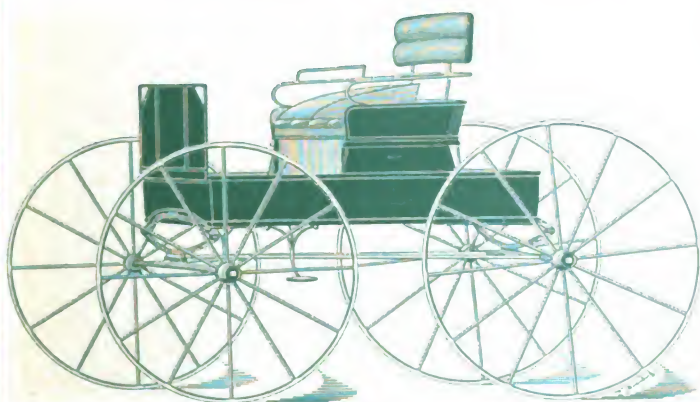
NOVELTIES.



No. 230.

OUR No. 230, AS SHOWN ABOVE, IS A VERY LIGHT FOUR PASSENGER PNEUMATIC SURREY. YOU WILL FIND DETAILED DESCRIPTION OF SAME IN THE EDITORIAL COLUMNS OF THIS NUMBER. * * * * *

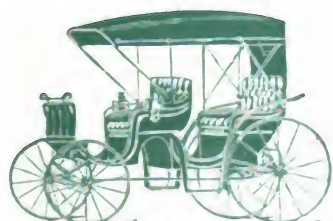
CATALOGUE NOW READY.



No. 224 B.

LARGEST AND MOST COMPLETE BUGGY FACTORY ON EARTH

WRITE FOR
PRICES AND
CATALOGUE



OUR GOODS ARE THE BEST
OUR PRICE THE LOWEST

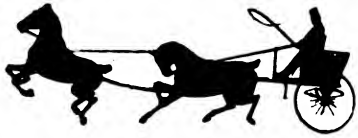
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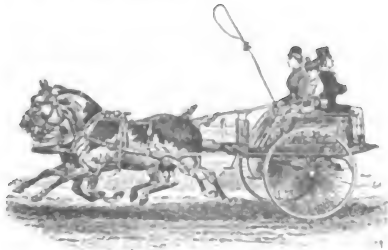


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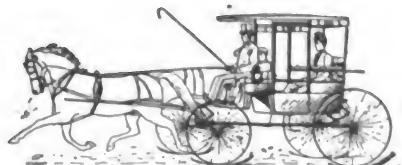
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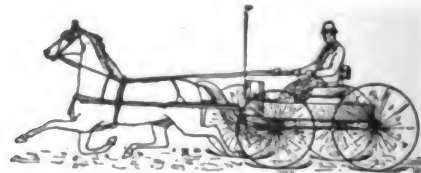
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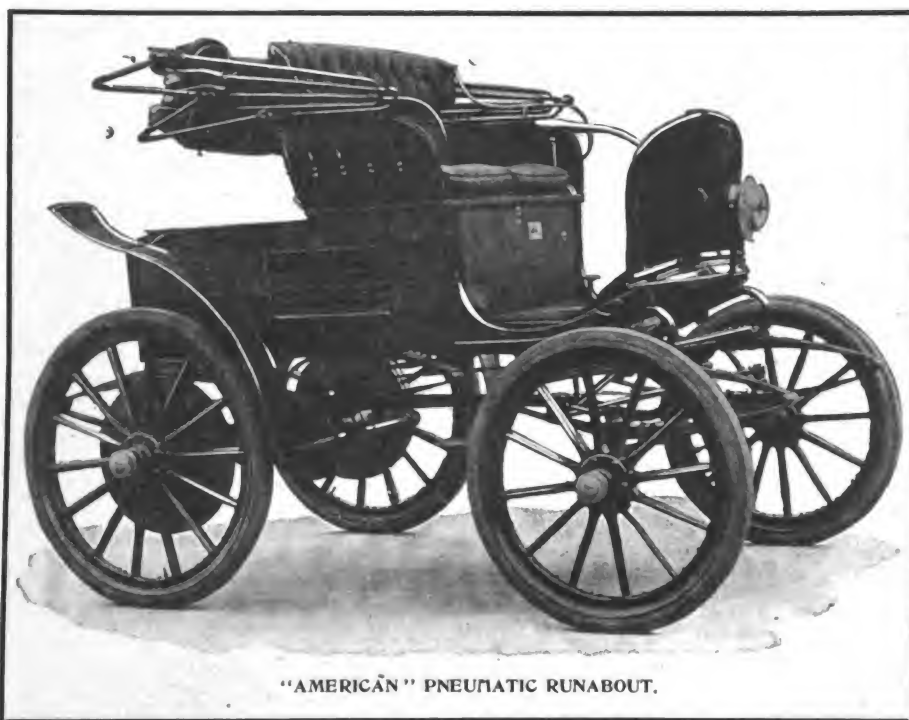
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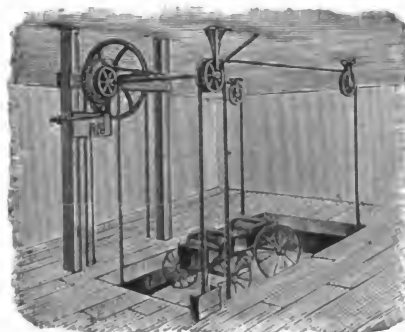
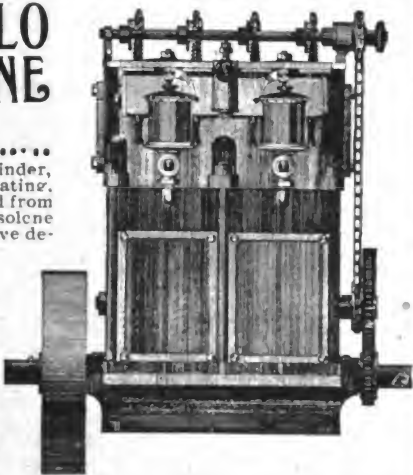
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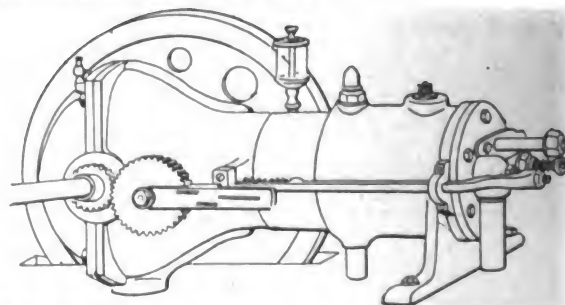
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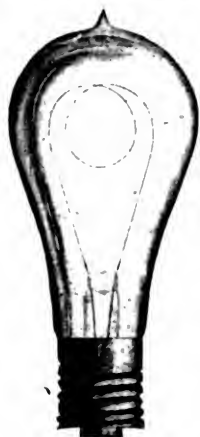
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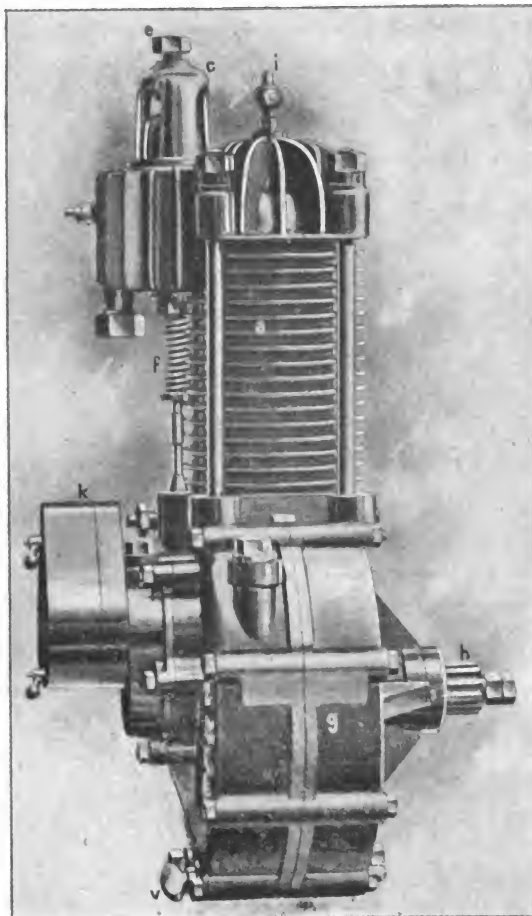
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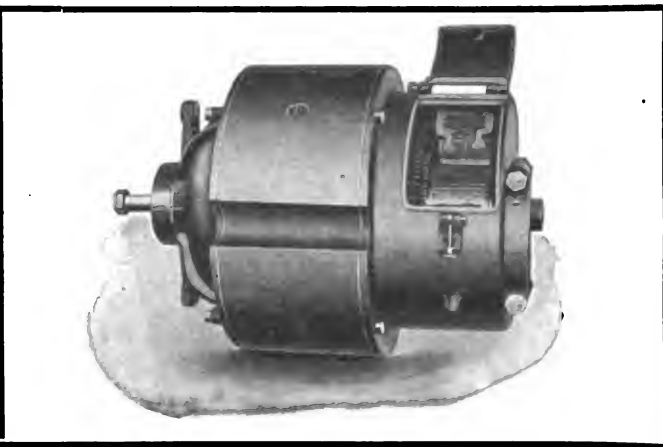
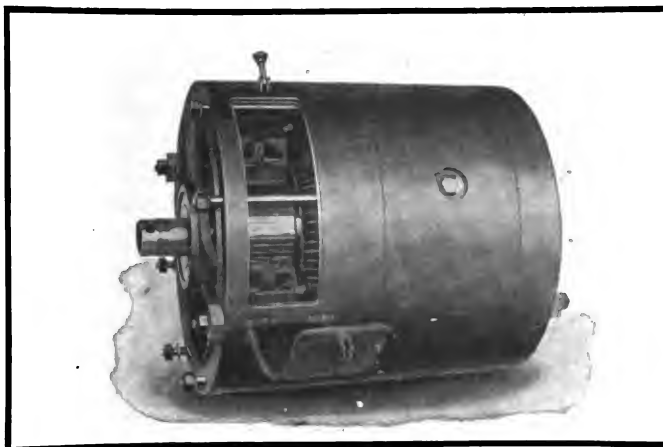
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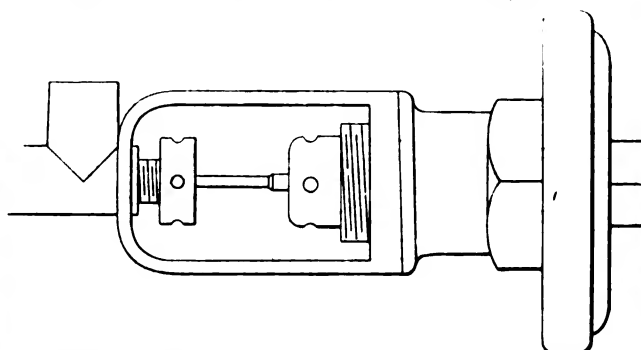
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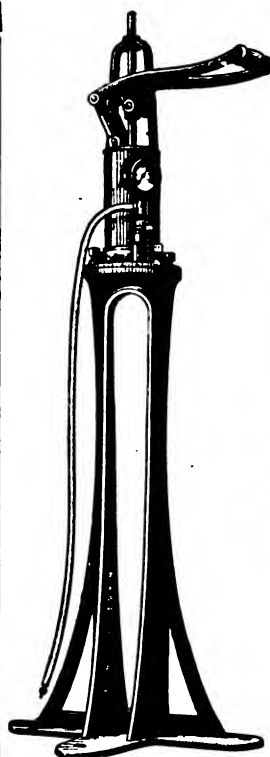
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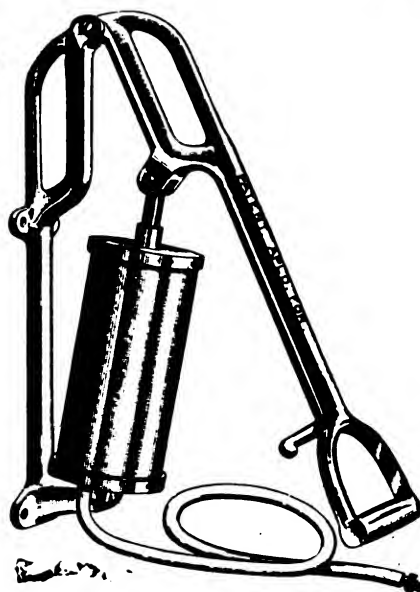
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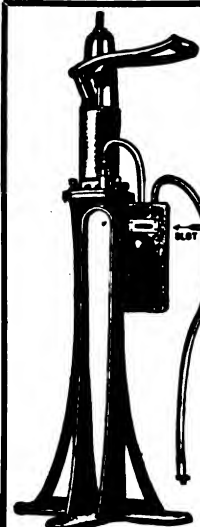


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VOL. XLII.

NEW YORK, APRIL, 1900.

No. 1.

Publishers :

TRADE NEWS PUBLISHING CO. OF N. Y.

W. H. TAYLOR, President.

WALTER D. GREGORY, Treasurer.

24-26 MURRAY STREET, NEW YORK.

THE HUB is devoted to the interests of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also to the interests of Dealers. Subscription Price for U. S. and Canada, \$2.00, payable strictly in advance. Single copies, 25 cents. Remittances at the risk of the subscriber, unless by registered letter, or by draft, express, check, or post-office order, payable to the order of TRADE NEWS PUBLISHING Co.

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Volume XLII.

WITH this number THE HUB begins its forty-second volume, under auspicious conditions. Circulation has increased during the last year more rapidly than ever before, and is steadily increasing. This increase has not been confined to any one of the branches of industry represented by it. Carriage manufacturers find it indispensable as a fashion guide and a technical instructor. This is proven by the demands made upon us for extra numbers and specific inquiries. It is therefore scarcely necessary to assure our readers that every effort will be put forth to keep up to, and, if possible, improve upon, the past in those departments. A very large proportion of our increase is with carriage dealers. There never was a time when our subscription list contained the number of dealers that it now does, and their appreciation is shown by their letters of approval, and because of this increase wholesale manufacturers are finding THE HUB's columns unequaled as mediums for reaching the

dealers, while manufacturers of materials have found their interests better subserved than ever before, through the acquaintance of the dealers with their products, and their subsequent request to the manufacturer to include specific articles in connection with vehicles furnished them. The automobile will be looked upon in the future, as in the past, as a branch of the vehicle industry, and will be treated fairly, not as a freak of the moment, nor as an exterminator of the horse and carriage, but as an addition to the vehicular industry, and another of those innovations that will appeal to and be in keeping with the forward tendency of the times. We will endeavor to keep before the public the different methods and make clear their claims for recognition. We shall aim to keep the carriage industry in close touch with the automobile, that the two may work in harmony, to the advantage of both. There are thousands of carriage dealers who cannot handle motor vehicles, and there are other thousands who can, and we shall continue to urge all who can handle them to do so, instead of inviting competition through merchants who do not now include vehicles of any class in their list of commodities. The improvement of our highways is another branch that has received much attention, and the work will be kept up, as THE HUB holds the belief that good roads mean increased use of carriages. The editorial department will continue the discussion of live topics, without fear or favor, and with the one hope of calling special attention to merits as they pass. The miscellaneous department will be maintained and improved whenever possible. In a word, THE HUB will aim to instruct, benefit and interest all whose interests may be directly or indirectly identified with the carriage, wagon and automobile, whether manufacturer, seller or user, in our own land, and in every other where these vehicles have been introduced, as well as those where they may be, and we hope to make the year 1900 a record year for THE HUB.



Prices of Iron and Steel.

THE advance in the prices of bar iron and steel has proved a serious matter with the builders of medium and low priced vehicles, both in the bar iron and steel used in the factory, and in the cost of forgings purchased from manufacturers of those articles. How long the prevailing conditions are likely to continue none can say to a certainty, but already there are signs of weakness, particularly in the steel market. There has been a marked increase in the output of pig iron, and with such an increase there will be a weakening of prices. This may not be enough to immediately affect the prices of bar iron or of steel, but it will be enough to pre-

vent any further advance, and it now looks as though the placing of orders for delivery two, three or more months ahead, at present prices, is no longer necessary, and that money will be saved by those who keep a safe supply to meet the immediate demand and buy only enough to maintain that supply. The next change in prices will be on the downward scale, and it is far better to purchase for immediate needs at current rates, than to stock up at present prices. No one can reasonably expect the prices to fall back to where they were three years ago, but that there will be a material decline from the high prices of 1899 is absolutely certain, no matter what the market may call for, owing to the fact that from ore to the finished bar or plate the iron industry is putting out more than ever before, and is in a condition to meet, if not to forestall, all demands. We say then, don't expect to get your supplies at the prices paid in 1898, but you will be able to scale those of 1899 if you order as you need, instead of stocking up for this year at present prices.



The Building Fever.

ALL reports confirm the belief that the disease that has proved most fatal to the carriage industry is spreading, a result due to last year's prosperity. That disease is the "building fever." It is fatal in its effects, and counts among its victims fully 50 per cent. of the large carriage firms who have failed during the last half century. Those who have escaped the malady are they who have moved on conservative lines, and have enlarged only as the demands of their business compelled. They increased their line of customers in advance of an increase of their products. So marked has this been during the forty years that have numbered our close connection with the carriage industry that we have accustomed ourselves to record a memorandum after names of large producers who have increased the capacity of their plants from 30 to 50 per cent., "Will fail in five years." and if reports are true, we fear we will be compelled to record new names on our list of "failures to come." The phenomenal business of last year placed the carriage industry in a better position than it has been since the prosperous days following the civil war, but even that does not warrant an increase of the output for the present year, and we honestly believe that if there could be a decrease of 10 per cent. for the year 1900 the trade would be richer than if the output of 1899 is maintained. We do not believe there is a factory running to-day that can with safety increase the size of its plant. Events in the business, as well as in the political world, shape themselves quickly in these days, and safety demands that all should be ready at a moment's notice to apply the brakes. We are inclined to be optimistic rather than otherwise in our views, but we do not believe there is anything in the present outlook to warrant the slightest expansion. The advance in prices will have the effect to reduce sales in the home market, and to close the foreign market if that increase exceeds 10 per cent., and in view of the greatly enhanced price of carriage material the carriage manufacturer must obtain more for his finished work than heretofore, or he will suffer loss, especially if he meets a sluggish market. The temptation to build a large plant comes to every man whose business has reached a prominent position, and sooner or later he learns to attribute his success entirely to his superior business acumen, and that no attempt will be too great for him to carry to success. Trusts are the outcome of individual overdoing, and if a carriage trust is ever formed it will be as a last resort for those who have grasped

more than they can hold. We are aware that those who measure themselves before a magnifying glass will laugh at what is here said, but that will not change the result, nor will it maintain the present prosperity of the carriage industry. The future for the next decade will be decided by the success met with in eradicating the "building fever." If new factories are built, and the production increased to meet the present demand, they will be kept running for a time after the reaction comes and a flooding of the market will follow. This will result in depreciated prices and the inevitable accompaniment, a flock of failures.



Export Trade and Increased Prices.

THE advance in prices of springs, bolts and other carriage ironware is working serious injury to the export trade in these lines. This is of much greater importance than it appears on the face. Years of hard work have been expended in order to place American goods in foreign markets, and now that the obstacles that have heretofore stood in the way are removed, it seems akin to crime to destroy the business by unduly advancing prices. It is true that the prices of steel and iron have advanced, but labor has not, and the doubling up on prices of manufactured goods does not appear to be warranted. The falling off in orders for springs from abroad has been fully 75 per cent. within the last four months. Large foreign firms, who have been buying here for two or three years, are now placing their orders in Great Britain or Belgium, and they give as their reasons for so doing the great increase in American prices. Just so with bolts; these have been advanced by American bolt makers 100 per cent. Canada is reaping a benefit from this, as Canadian bolts are laid down at Buffalo, N. Y., even after all duties are paid, at 10 per cent. better prices than those asked by American bolt makers, and American exporters, in order to hold their trade, are exporting bolts made in Canada. The same conditions exist in almost every other line of metal goods, and unless checked, we are likely to lose a very large percentage of the export trade, which, until recently, was growing rapidly. If the trade passes to other countries it will require another decade to turn the tide once more in our favor. The loss for a single year becomes a serious matter, but it is a mere pittance as compared to the losses that will follow. One of the most serious complaints made against American products has been the instability in prices, and if we lose now from this source it will require years of stable prices to give foreign customers confidence. The foreign buyer is accustomed to placing orders ahead of wants, but he will not do so on an advancing scale, nor will he if stability at satisfactory prices is not assured. The past year was one of great prosperity, but it will not do to expect a continuance if prices are to be advanced all along the line, and without a foreign market to take our surplus there will be a surplus and prices will break or manufactures will be reduced. Our manufacturers are facing a dangerous condition, one that will wreck many well laid plans unless the volume of exports is maintained. We know the advance in metals has been great, but we cannot but feel that manufacturers are making a great mistake by advancing their scales more than is necessary to cover the increased cost of the raw material. The world is watching American manufactures, and there is a wholesome dread of the result among other manufacturing nations, and they will not be slow to take advantage of an advance in our prices and the instability resulting therefrom.

LOVING CUP FOR COLONEL CARLISLE.

SHORTLY after the C. B. N. A. Convention at Indianapolis, last October, friends of Colonel Charles Arthur Carlisle started a movement for small subscriptions, with which to procure a "loving cup," to be presented to him in recognition of his active work in behalf of the accessory members of the Carriage Builders' National Association. The movement proved a success, and a loving cup was procured and properly engraved, a photo reproduction of which is here presented to THE HUB's readers.

THE HUB extends congratulations to the Colonel on receiving this neat and appropriate recognition of his efforts and the accessory trades in having so able an advocate. The cup has been



forwarded to the Colonel at his home in South Bend, Ind., accompanied by the following letter from the donors:

TO COLONEL CHARLES ARTHUR CARLISLE: The accessory members of the Carriage Builders' National Association have for some time past recognized a champion of their interests in the person of yourself—a championship especially shown at the meeting in Indianapolis.

We are not disposed to allow your earnest efforts in our behalf to pass unnoticed, and in expression of our appreciation, we beg the acceptance of this "loving cup"—a gift from a large number of your friends,

THE ACCESSORY MEMBERS.

Description of Latest Styles.

CORNING.

Scale, $\frac{1}{2}$ in. to the foot.

(See Fashion Plate No. 459.)

FASHION PLATE No. 459 illustrates a roomy Corning with a slat seat, hung upon an elliptic spring gear by Bailey hangers. The new points shown will readily commend themselves to the builder of this class of buggy who is looking for desirable changes in lines.

Dimensions of Woodwork.—Body, width across top, 31 in.; across bottom, 30 in. Width of seat across top, 40 in.; across bottom, 36 in. Wheels, wood hub. Height, front, 42 in.; rear, 46 in. Hubs, length, $6\frac{1}{2}$ in.; diameter at center, $3\frac{3}{4}$ in.; front end, $2\frac{3}{8}$ in.; back end, $2\frac{7}{8}$ in. Size of spokes, $1\frac{1}{4}$ in. Number of spokes, 14 and 14. Stagger, $\frac{3}{8}$ in. Depth of rims, $1\frac{1}{4}$ in. Tread of rims, 1 1-16 in. Depth of bands, front, $2\frac{1}{2}$ in.; back, $\frac{7}{8}$ in. Distance between center of axles, 58 in.

Dimensions of Ironwork.—Springs, front, 34 in. long between centers of heads, with 6 in. opening on main leaf. Width of steel, $1\frac{3}{8}$ in. Number of plates, 3. Thickness, Nos. 3, 4, 4 steel. Back, 34 in. long, with $6\frac{1}{2}$ in. opening on main leaf. Width of steel, $1\frac{3}{8}$ in. Number of plates, 3. Thickness, Nos. 3, 4, 4 steel. Axles, front and rear, $1\frac{1}{8}$ in. Tires, $1\frac{1}{8}$ in. by 3-16 in., steel. Fifth wheel, 12 in. diameter. Track, outside, front and rear, 4 ft. 8 in.

Painting.—Body and seat black. Gear, red; clips, bands, etc., painted black; no striping. Trimming, drab whipcord. Back, plain cushion squabbed. Finish, rails, lamps and dash are black.

TWO WHEELER.

Scale, $\frac{1}{2}$ in. to the foot.

(See Fashion Plate No. 460.)

FASHION PLATE No. 460 illustrates a two wheeler of new and pleasing design. While retaining the stanhope pillar, the lines are

so modified as to give a general change in the appearance of the body. The construction of the seat, with the narrow diagonal panel, is a feature worthy of attention.

Dimensions of Woodwork.—Body, width across outside, top, 31 in.; bottom, 30 in. Width across top, outside of pillars, 40 in.; across bottom, 32 in. Wheels, wood hub. Height, 46 in. Hubs, length, 7 in.; diameter at center, $5\frac{3}{4}$ in.; front end, 4 in.; back end, $4\frac{3}{4}$ in. Size of spokes, $1\frac{1}{2}$ in. Number of spokes, 14. Stagger, $\frac{1}{2}$ in. Depth of rims, $1\frac{3}{8}$ in. Tread of rims, 1 7-16 in. Depth of bands, front, $3\frac{1}{2}$ in.; back, 1 in.

Dimensions of Ironwork.—Springs, side, 42 in. long between centers of heads, with $3\frac{1}{2}$ in. set on main leaf. Width of steel, $1\frac{1}{2}$ in. Number of plates, 5. Thickness, No. 4 steel. Cross, 36 in. long, with $3\frac{1}{2}$ in. set. Number of plates, 4. Thickness, No. 4 steel. Axles, $1\frac{1}{2}$ in. Tires, $1\frac{1}{2}$ in. by 5-16 in., steel. Track, outside, 4 ft. 8 in.

Painting.—Body, black, excepting the panels which extend diagonally across the seat sides and the imitation blinds, which are carmine. Gear, carmine, striped with two $\frac{1}{8}$ in. lines of black. Trimming, cream colored whipcord. Back and cushion made in blocks. Finish, hand rails, lamps and dash, black.

STRAIGHT SILL SURREY.

Scale, $\frac{1}{2}$ in. to the foot.

(See Fashion Plate No. 461.)

FASHION PLATE No. 461 illustrates a plain straight sill surrey, with slat seats, the body being without moldings, and the seat, slats and rail also finished flat and plain. The gear is a plain, single perch elliptic spring, the body being hung off on Bailey hangers.

Dimensions of Woodwork.—Body, width across top, outside, 31 in.; across bottom, 30 in. Width of seat across top, outside, 42 in.; across bottom, 36 in. Wheels, wood hub. Height, front, 40 in.; rear, 44 in. Hubs, length, 6½ in.; diameter at center, 4 in.; front end, 2¾ in.; back end, 3¼ in. Size of spokes, 1 5-16 in. Number of spokes, 14 and 14. Stagger, ½ in. Depth of rims, 1 5-16 in. Tread of rims, 1¼ in. Depth of bands, front, 2½ in.; back, ¾ in. Distance between center of axles, 71 in.

Dimensions of Ironwork.—Springs, front, 35 in. long between centers of heads, with 7 in. opening on main leaf. Width of steel, 1½ in. Number of plates, 4. Thickness, Nos. 3, 4, 4, 4 steel. Back, 35 in. long, with 7½ in. opening on main leaf. Width of steel, 1½ in. Number of plates, 4. Thickness, Nos. 3, 4, 4, 4 steel. Axles, front and rear, 1¼ in. Tires, 1¼ in. by ¼ in. Fifth wheel, 14 in. diameter. Track, outside, front and rear, 4 ft. 8 in.

Painting.—Body and seat, black. Gear, sulphur yellow. Clips, bands, etc., painted black; no striping. Trimming, dark gray or drap whipcord. Backs made in double roll. Cushions upholstered in blocks. Finish, lamps, rails and dash, black.

EXTENSION TOP PHAETON.

Scale, ½ in. to the foot.

(See Fashion Plate No. 462.)

THE popularity of the extension top phaeton is such as to warrant the production of new designs, and we contribute Fashion Plate No. 462 as our latest in that line, and call special attention to the quarter lines, light front seat, and commodious proportions of both seats and body.

Dimensions of Woodwork.—Body, width of rear seat across top of pillar, outside, 48 in.; across bottom, 37 in. Turnunder, 5½ in. Wheels, wood hub. Height, front, 36 in.; rear, 46 in. Hubs, length, 6¾ in.; diameter at center, 4 and 4½ in.; front end, 2¾ and 3¾ in.; back end, 3¼ and 3½ in. Size of spokes, 1¼ and 1¾ in. Number of spokes, 12 and 14. Stagger, ¾ in. Depth of rims, 1 3-16 and 1 5-16 in. Tread of rims, 1¼ in. Depth of bands, front, 3 in.; back, ¾ in. Distance between center of axles, 80 in.

Dimensions of Ironwork.—Springs, front, 35 in. long between centers of heads, with 7 in. opening on main leaf. Width of steel, 1¾ in. Number of plates, 5. Thickness, No. 4 steel. Back, 36 in. long, with 7½ in. opening on main leaf. Width of steel, 1½ in. Number of plates, 4. Thickness, No. 4 steel. Cross, 36 in. long, with 4 in. set on main leaf. Number of plates, 5. Thickness, No. 4 steel. Axles, front, 1¼ in.; rear, 1¾ in. Tires, 1½ in. by 7-32 in. steel. Fifth wheel, 14 in. diameter. Track, outside, front and rear, 4 ft. 8 in.

Painting.—Body: The front pillars of seat are painted light olive green. The quarter and back panels of rear seat are painted dark olive green. Remainder of body is black. Gear is painted light olive green, striped with a single 3-16 in. line of black. Trimming: Light colored cloth is used throughout. Finish, lamps, rails, dash and fender, black.

HOMER WAGON CO.'S PNEUMATIC SURREY.

(See "Latest Styles.")

PLATE XXXV. illustrates a no top pneumatic surrey, built by the Homer Wagon Co., of Homer, N. Y. The body is light, plain and roomy. The deep spindle seats contribute to add a pleasing appearance. The naked ball bearing elliptic spring gear is the best in its line. Wheels, 34 and 36 in., with 2 in. tire. Axle, 1 5-16 in. Trimming, whipcord. Painting in the most popular colors and combinations.

ROAD BRAKE.

(See "Latest Styles.")

PLATE XXXVI. illustrates a road brake manufactured by Folger & Drummond, of Amesbury, Mass. This vehicle is put up on the latest lines for its class. The seats are extra wide, giving 42 in. top to cushion. The wheels are 3 ft. 2 in. and 3 ft. 10 in.; axles, 1¼ x 6½ in.; springs, front, 1¼ in. steel, 4 plates; back, 1¾ in., 4 plates. Trimming, russet leather or whipcord, to suit buyer. Painting, generally primrose, yellow and black; pole sockets rubber lined. The brake is known as their No. 231.

CUTUNDER SURREY.

(See "Latest Styles.")

PLATE XXXVII. illustrates a cutunder surrey, manufactured by the Owosso Carriage Co., Owosso, Mich. It is a roomy and attractive vehicle. The plain gear, with elliptic springs, gives a good underpart at small cost. The axles are 1 1-16 in. Springs, 1¾ in. four and five plates. Fifth wheel, 12 in. Track, 4 ft. 8 in., or 5 ft. 1 in. Wheels, plain or Sarven. Painting, black body, carmine or green gear. Trimming, whip cord or broadcloth.

HOTEL WAGONETTE.

(See "Latest Styles.")

PLATE XXXVIII. illustrates a twelve passenger wagonette built by Studebaker Bros., of South Bend, Ind., and used by the Oliver Hotel of that city for transportation between the hotel and railway stations. The body is 14 ft. 6 in. long over all, and 5 ft. wide. Door, 27 in. wide; aisle, 24 in. wide. Height from floor to roof, 5 ft. 8 in.; from driver's seat to roof, 3 ft. 10 in. The wheels are Sarven pattern, 2 ft. 9 in., and 3 ft. 9 in. high. Axles, ball bearings, 1½ and 1¾ in. Drop lights, beveled plate glass. Trimming, leather. Painting, body, green, vermilion and gold, interior, natural wood. Weight of vehicle, 2,875 pounds.

LADIES' PHAETON, WITH DOUBLE TEAM.

(See "Latest Styles.")

PLATE XXXIX. illustrates an attractive turnout for a lady, and represents one of the winners at a popular horse show. The vehicle is built upon the "spider" lines, but lighter and lower. It is hung upon a low wheeled platform carriage and rubber tire. The harness is a light, long tug, coach pattern, swivel check, full plate harness and mountings, and steel pole chains. The illustration will warrant a close study on the part of the carriage builder, harness maker and the carriage dealer who includes harness in his stock.

NEW YORK BROUGHAM WITH DOUBLE TIRES.

(See "Latest Styles.")

PLATE XL. illustrates a blue ribbon turnout in the brougham class for teams and carriage, and accoutrements. The New York Horse Show is looked upon as the special patron of the brougham, and it is expected that each fall's show will invite the appearance of the latest design and finish of that special vehicle. Everything in connection with this turnout is in conformity with the most approved ideas in connection with the brougham, the harness, as well as the horses, being subject to examination by the judges. The long tugs have four short loops, the pads are swell pattern, with round ends, the frogs being of the same general form. The artist was fortunate in getting so good a position, one that shows every part that can be seen in a print to the best advantage.

HORSE SHOWS FOR 1900.

NEW ORLEANS, La., April 25, 26, 27 and 28.

Brooklyn, N. Y., the Riding and Driving Club, G. H. Potter, secretary, April 26, 27 and 28.

Canadian Association (Toronto). Henry Wade, secretary, April 26, 27 and 28.

Philadelphia, William S. Ellis, secretary, 411-422 Harrison Building, Fifteenth and Market streets, May 29, 30, 31, June 1 and 2.

Atlantic City, N. J., Henry W. Leeds, secretary, July 11, 12, 13 and 14.

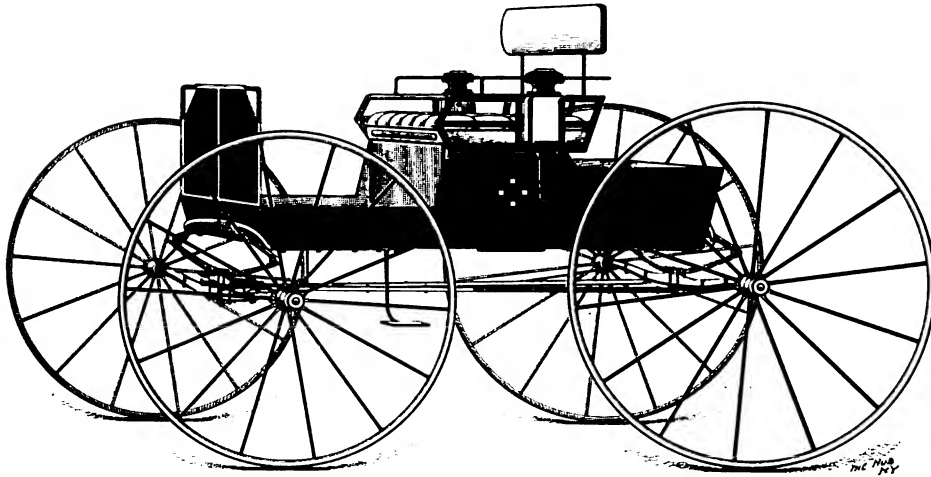
Long Branch, N. J., Monmouth County, P. J. Casey, secretary, August.

Newport, R. I., Henry F. Eldridge, secretary, 1 West Thirty-eighth street, New York City, September 3, 4 and 5.

New York State, Syracuse, N. Y., September 17 to 22.

New York National Horse Show Association, J. G. Heckscher, secretary, 16 East Twenty-third street, November 12 to 17.

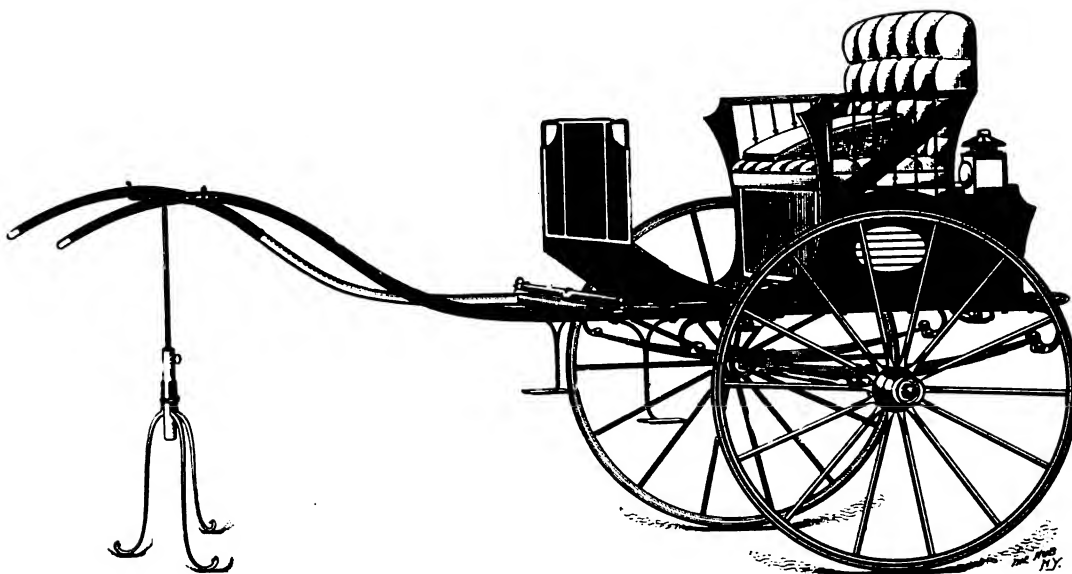
Latest Styles. April, 1900.



No. 459. CORNING. Scale, One-half Inch.

See description under "Latest Styles" in this number.

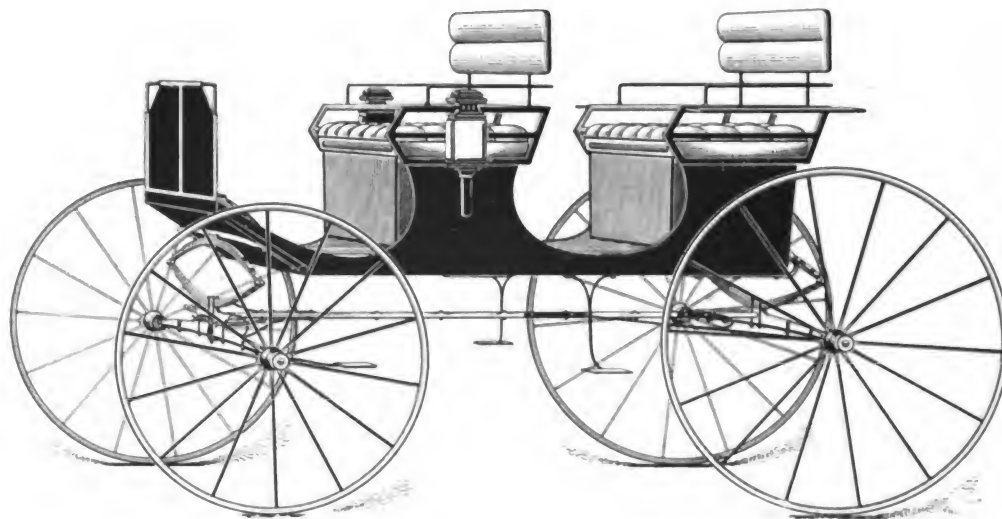
(Electrotype, \$1.23.)



No. 460. TWO WHEELER. Scale, One-half Inch.

See description under "Latest Styles" in this number.

(Electrotype, \$1.25.)



No. 461. STRAIGHT SILL SURREY. Scale, One-half Inch.

See description under "Latest Styles" in this number.

(Electrotype, \$1.50.)



No. 462. EXTENSION TOP PHAETON. Scale, One-half Inch.

See description under "Latest Styles" in this number

(Electrotype, \$1.50.)

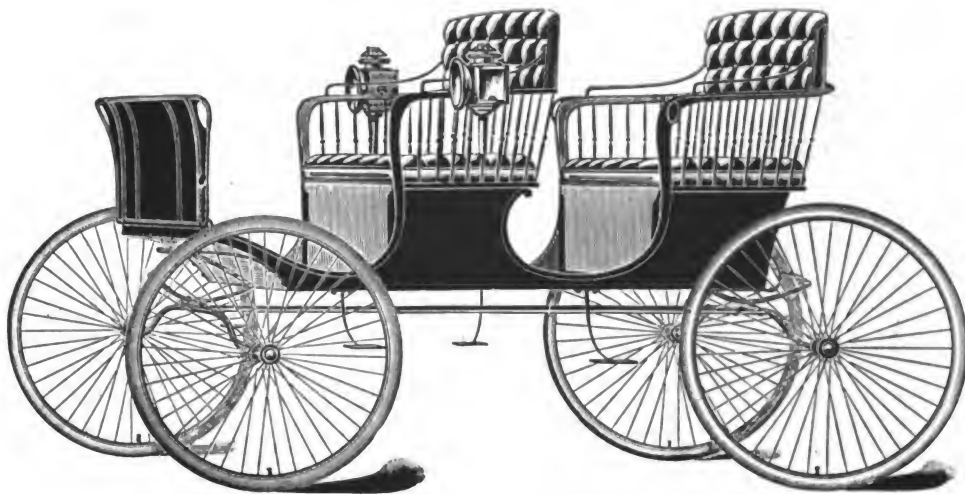


PLATE XXXV. PNEUMATIC SURREY.

See description under "Latest Styles" in this number.

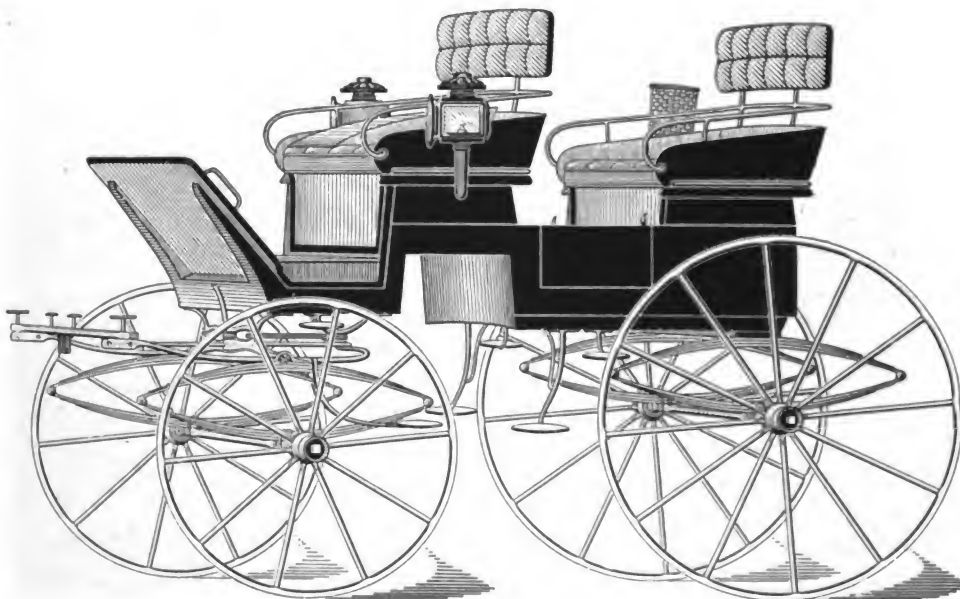


PLATE XXXVI. ROAD BRAKE.

See description under "Latest Styles" in this number.

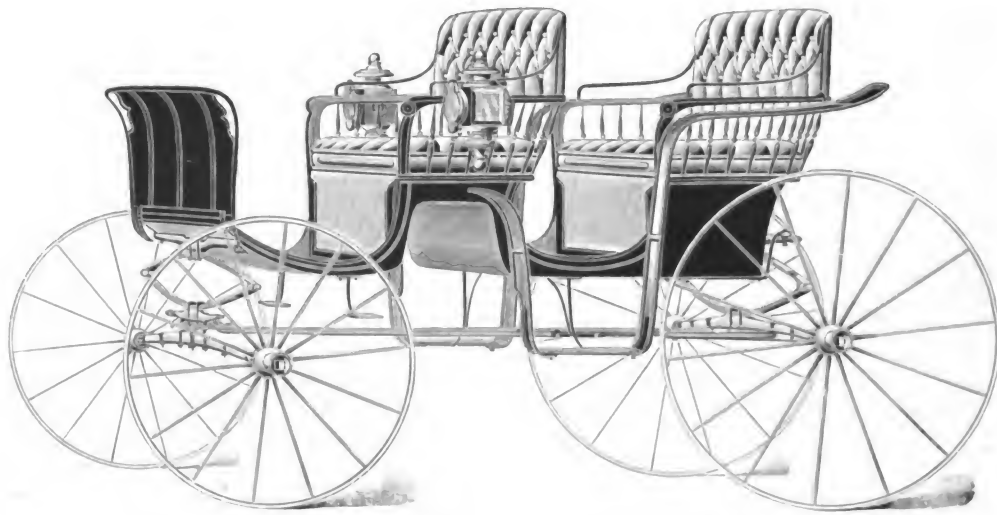


PLATE XXXVII. CUT-UNDER SURREY.

See description under "Latest Styles" in this number.



PLATE XXXVIII. HOTEL WAGONETTE.

See description under "Latest Styles" in this number.



PLATE XXXIX. LADIES' PHAETON AND TEAM.

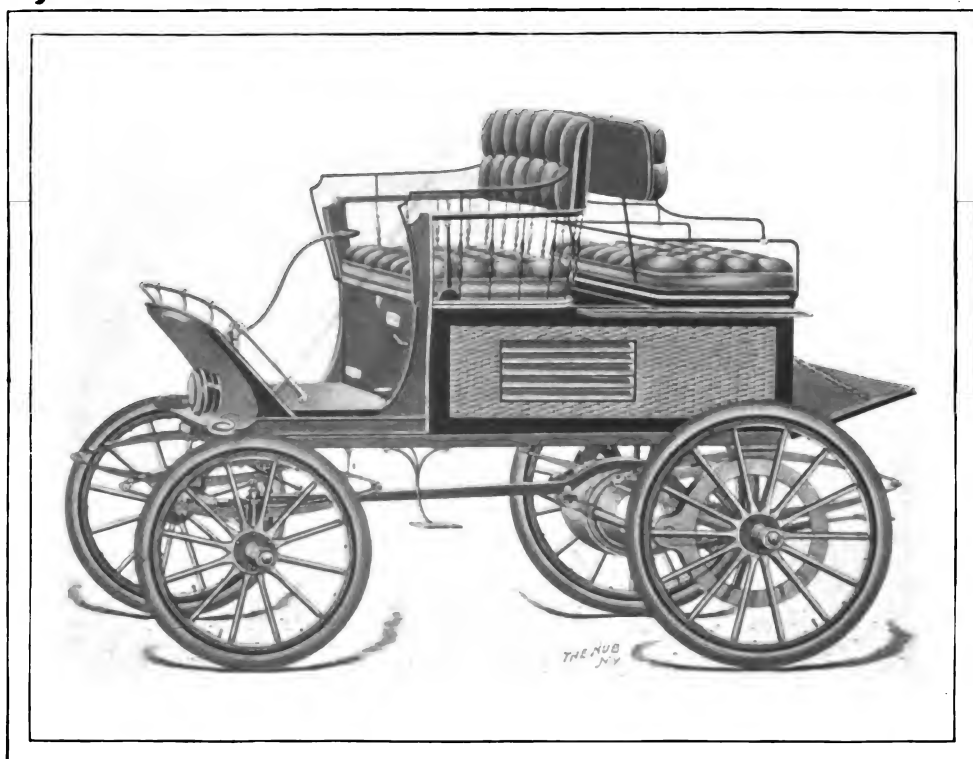
See description under "Latest Styles" in this number.



PLATE XL. BROUGHAM AND TEAM.

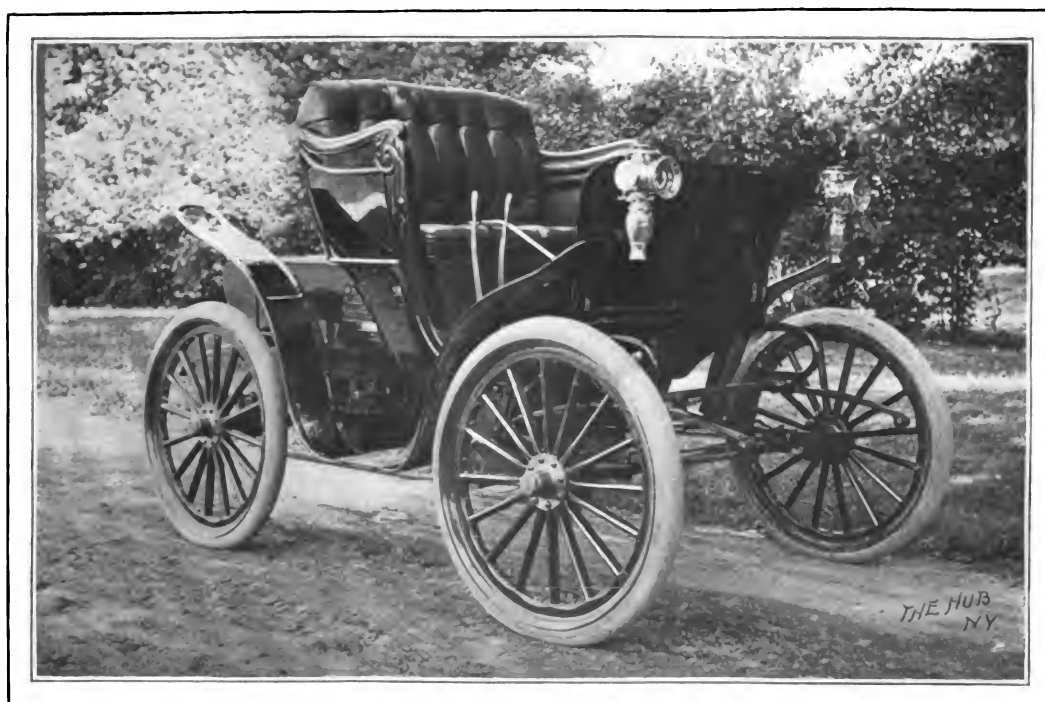
See description under "Latest Styles" in this number.

AUTOMOBILE ILLUSTRATIONS.



AMERICAN ELECTRICAL VEHICLE CO.'S TRAP.

For description, see Automobile Department.



ST. LOUIS MOTOR CARRIAGE CO.'S PHAETON.

For description, see Automobile Department.



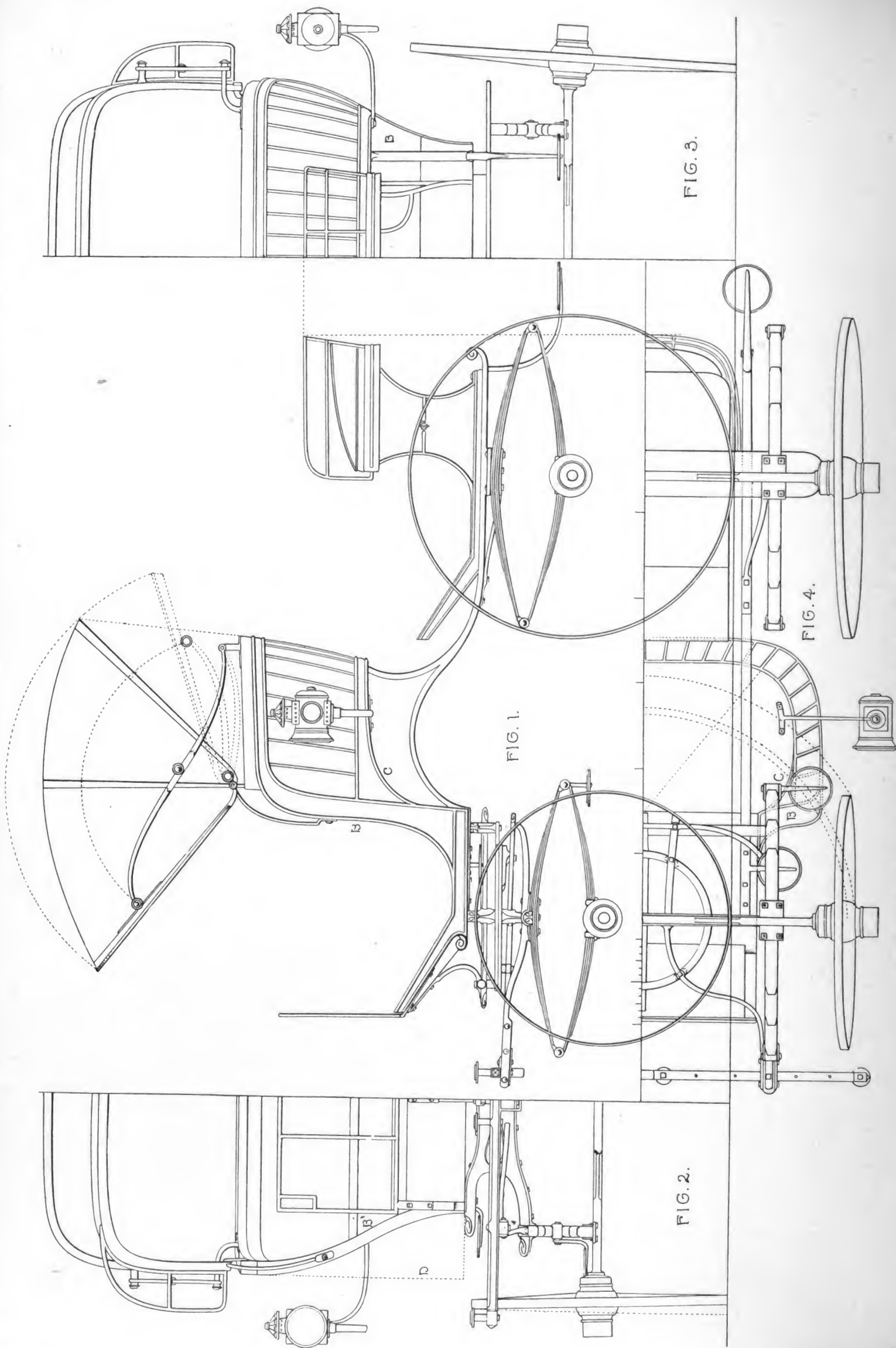
UNITED STATES MOTORMOBILE CO.'S PHAETON.

For description, see Automobile Department.



THE STRONG MOTOR WAGON.

For description, see Automobile Department.



WORKING DRAWING OF A SPIDER PHAETON. SCALE, $\frac{1}{4}$ INCH TO THE FOOT.

Wood Department.

WORKING DRAWING OF A SPIDER PHAETON.

Scale $\frac{3}{4}$ inch to the foot.

THE working drawing of a spider phaeton shows a light construction for two persons, besides the footman. The length is 9 ft. 10 in. over all; height, 8 ft.; width, 6 ft.; track, 4 ft., 9 in., and mounted on 36 and 46 in. plain wheels. The style of the body is a round corner panel seat, 50 in. wide, 23 in. deep and 19 in. high. The slats glued on the seat panels are $\frac{3}{8}$ in. wide by 3-16 in. thick, made of white wood. These are spaced from the plan. Afterwards their points are carried to the side and back elevations. The body is mounted on iron loops; these loops are bolted to the gear, back and front. The boot rocker is boxed out at the front, $1\frac{1}{2}$ in. wide by 1 in. deep, to conceal the coupling, and thus the gears, back and front, are poised as shown in the draft. The bracket front rocker is $3\frac{1}{2}$ in. wide, by $2\frac{1}{4}$ in. deep, this loop extending to the king bolt straight bed, and secured by bolts. The rumble is a frame of ash; the brackets are put in the boards from the bottom, and bolted to an iron cross bar $1\frac{1}{2}$ by $\frac{1}{2}$ in. The ends are bolted to lugs forged solid on the loop. Iron posts are erected upon this frame to take the seat frame, which has round corners like the front seat, a projection of which is shown in plan. Mount the body as shown, on four elliptic springs, but a three spring perch gear can be used if desired. The front gear can be supplied with shafts for one horse when desired. Two steps are placed at the front and two at the back, which provide an easy entrance and exit to and from the seats. The first step to the front seat is fixed to the head of the elliptic, the second to the loop. The first step is forged to the body loop, the second is the end of the spring bar, extending out over the spring; all the step pads are fitted with rubber.

The design of the toe bracket is a popular form for this type of carriage, and for breaks, mail phaetons and wagonettes. The pillar is stump tenoned into the rocker and secured by screws from the bottom. The toe is boxed to take the foot of dash, leaving the top smooth, upon which is screwed a thin plate, instead of a leather cover; a section of this plate extends up the front edge of the pillar, protecting its beaded edges from mutilation, and at the same time supporting the joints intact, and when put on with white lead in the best manner will resist injury from water. The side elevation is shown by Fig. 1.

The front and back elevations show the width and the turnunder of the wing pillar B B B B, which is curved and has a turnunder of $9\frac{1}{2}$ in., as projected in Fig. 2. By doing this we obtain a width on the seat of 40 in., leaving 32 in. width on the bottom and 50 in. at the top of seat perch; the result of this curve is better understood by consulting its projection in plan, Fig. 4. The construction of the seat is round and of familiar outline, but when finished by a first rate hand will give the original touch, a very smart and artistic contour, not only on the outside, but the inside surfaces as well, as the trimmer will, if the maker understands his craft, follow the idea of the design of the body, and by so doing obtain from his work the pleasing effect which will attract the purchaser. Those who are learning to build carriages are likely to be close observers, consequently imitators, and they are in this pursuit liable to take for a model a second rate design, where, for instance, the front springs might have a different spread on the axle to that of the back elliptics; where the back bow is longer than the front bow, and where the carriage is coupled up so short that the length is less than the width or height, and where the footman is crowded into a space that is too small for the falling of the top. It is better to give a length that will provide ample room for the above conditions than to cram them. Here the distance between the center of axles is 63 in., and the width of the seat frame of the rumble 24 in. by 18 in. deep, so that the space between the seat and the hind wheel is large enough to pass conveniently.

The height of the coach model gear is 9 in.; the fifth wheel is 20 in. in diameter; the coach beds are straight, as in this kind of carriage there is no reason to make a swept bed, which sets the king bolt ahead. Here we really need the room the other way instead, but we can see by the plan in the trace, which the top of the tire of the wheel follows, that the clearance at all points will be greater than the opening of the elliptic springs, and since the space under the

seat is open below the bottomside, C, Fig. 1, interference in locking the wheel under the body is avoided; but we could go to work and make an elaborate projection of points to show up a scientific display of technicalities belonging to the principles of the suspension of the spider phaeton, but it would cross our other particular ideas connected with this design, and confuse or rather dominate the previous intention, of showing instead a perfect model of a stylish spider phaeton. We have not employed dotted lines, which determine the position of points, which to do must to a certain extent obliterate the appearance of the elevations. We consider in this case that the design is of more importance than the technical instruction would be, as the principle is the same in all, and for once we will forego our usual treatment in our working drafts. The particular reason why we think that this model is correct in construction is that, first, the seat corners are very round, and the stanhope pillar is curved in the vertical direction, both as seen from the front and the side, being a convex-concave in both directions. Thus the projection of the curved surfaces in plan goes to show the beauty of effect which they will produce, when properly executed by a skilled bodymaker. Some might contend that it would require excessive thick plank to make up the body, but this is an error, since the pillar is built up to a vertical surface on the inside, by gluing on the necessary thickness.

Three inch ash is the thickest required, and if put to it $2\frac{1}{2}$ in. will do, and in each particular makes a better and cheaper body. It is a common practice, in getting out a coupé pillar for broughams, to glue on, or build up, to the required dimensions. The top rail is of bent ash, the panel grooved in and moldings worked solid.

When we make a round seat like this, knowing that the bows are also round, we can foretell the symmetrical appearance which the leather will have when fixed to the seat rail and the bow, and if both curves correspond the leather will be smooth and very near the same curve, hence the regular victoria back bow is not needed on a round corner seat. Again, the interior of the seat is round, conforming to the contour of the person, and consequently the comfort thus obtained is appreciated; evidently the interior of the upholstered seat will appear more inviting than angular designs. The rumble is also made up of round lines, and the gear fitted with round rubber covered step pads, round flange lamps and round top bow wings. The placing a lazyback on the seat rail of the rumble is a question as to utility, and a matter of taste as to appearance.

We show the spider in the wood and iron mounted, which will give the builder a correct idea of the finished carriage, its dimensions, the height of the gear, which when weighted with its complement of three riders will settle some $2\frac{1}{2}$ in., which accounts for its height in draft.

It has been the custom to set up the dash to a vertical line, but it is a custom to be discarded along with setting up an elliptic spring to the same height at both ends. If the dash leans a trifle toward the front it will have a better poise than if upright.

MORE CHANGES ASKED.

RAILROAD companies operating in Illinois have petitioned the Railroad and Warehouse Commission for higher classification on certain articles and for a change in the rule governing carload minimums not specified in classification. The commission will sit at the Great Northern Hotel, Chicago, March 22, to hear arguments for and against the proposed changes; at which time all interested shippers will have an opportunity to enter protest.

A few changes affecting implements and vehicle interests are asked. The western classification minimum on vehicles, C. L., is sought. This involves no change except to add the provision for 2 per cent. per foot addition to the minimum of carloads of mixed vehicles, on cars exceeding forty feet in length. Aside from this the western and Illinois schedules are identical.

The Illinois classification is contradictory in several instances. By one interpretation certain vehicle and wagon parts, such as axles combined with bolsters, skeins, steps, wagon rods, tires and wheels, would also come under the new rule if adopted; by another all vehicle and wagon parts take the minimum specified for complete jobs. The shippers will know what construction the railroads have heretofore put upon the matter.—*Farm Implement News*.

THE things to be desired for man in a healthy state are, that he should not see dreams, but realities; that he should be not rich, but content.

Smith Department.

WILL THE RUBBER TIRE CAUSE THE PASSING OF THE SMALL CARRIAGE REPAIR SHOP?

THE changes which are being continuously wrought as time keeps trudging along are rarely noticed at the time, but when recorded as features of the past they stand out in bold relief, and tell us of the "has beens." The crying woman at old country funerals, the chimney sweep, the lost child man and his bell, and many such that were prominent everyday features and everywhere to be seen about the streets of the metropolis, have, like the average country boy, who takes his sled in the winter time out on the long winding hill and mounts it for a coast to the bottom, "just slid out of sight." Larger and more important things have slid around the corner out of sight. The street omnibus will soon be forgotten, and the street horse car has almost reached the end of its last run.

Years ago carriage building, and in fact all kinds of wheeled vehicle building in New York, were local points of industry in the metropolis. To-day comparatively few vehicles are manufactured in the city. Pleasure vehicles which are made in New York are made chiefly for those who possess vast amounts of wealth, and are made by a few concerns. There is a cause for everything which occurs. The increase in the use of anthracite as a fuel created no soot or lampblack in the chimney, as wood did, consequently the chimney sweeper exercises that calling no more.

The street railway car sang the requiem of the omnibus. The trolley system has pushed the horse car off the track, and told the street car horseshoer to go a-hunting for another job. New York cannot build carriages as cheap on land worth \$200 per square foot, with work rooms suspended in the air, as other towns can on ground worth \$50 or \$100 an acre, with all the shops at or on the surface.

People engaged in the making and repairing of carriages were prone to laugh and sneer at the writer when told that vibration of the parts of a vehicle passing over stone pavements was the agent that produced the many fractures of wheeled vehicles in the many parts of wood and iron. The writer also said that not until soft pavements or soft tires came into use would there be any change. The buffer cushioned axle produced a little diversion in favor of reducing noise—its main object. The rubber tire, solid, semi-solid, or pneumatic, together with the soft pavement, have hit the economical nail on the head in this town. If the tires are put on properly there is no telling how long the vehicle will go without repairs. The impacting of the iron tire on the stone pavement creates such a continuous vibration that the latent heat of the steel or iron is lost. When the latent heat is gone then comes crystallization, granulation, then fractures.

The rubber tire does not shut off vibration entirely. It reduces it to a minimum; in the end the result is the same. In consequence of this the great number of carriage makers who depend solely on repairs of carriages for a living began to complain. Where there was formerly work for three fires and thirty hands there is to-day not enough for one fire to do, while six men make up a full complement for the plant. One of the pet phrases is "The man who invented rubber tires ought to be hamstrung." And there are many others too positive to mention, but nevertheless the passing of the small carriage repair shop is not hidden very deep in the future.

TIRE BOLT HOLDER.

IF there is anything about carriage making and repairing that will bring about bull dog feelings and bring into existence sailor words, it is a tire bolt on which the nut has become rusted and set, and which cannot be loosened by the best persuasive qualities of the wrench, owing in part to the bolt persisting in rotating in the hole in the rim and tire. The various methods used to turn the nut loose would fill a copy of THE HUB, more especially when the bolts and nuts were all hand made and hand cut. One of the favorite methods was to take a tool similar to a horseshoer's punch, usually termed a "Pritchel." This was for years a universal favorite with all repair smiths, helpers and finishers. In using it, the point would be inserted under the head of the bolt and the tool driven in with the hammer until the desired results were reached. A good, and one of the best methods, is to cut or split the nut, but where tire bolts and

nuts are scarce the tire bolt holder we now illustrate and describe is the best method to adopt. Fig. 1 shows the tool as a whole; A, the plate, to which the hooks C C are attached, forming the recesses D D, in which to clasp the rim; B, the embossed socket, through which passes the set screw, which holds the bolt fast; E, the tempered steel point; F, the head.

Fig. 2 shows the set screw; A, head; B, screw section; C, steel

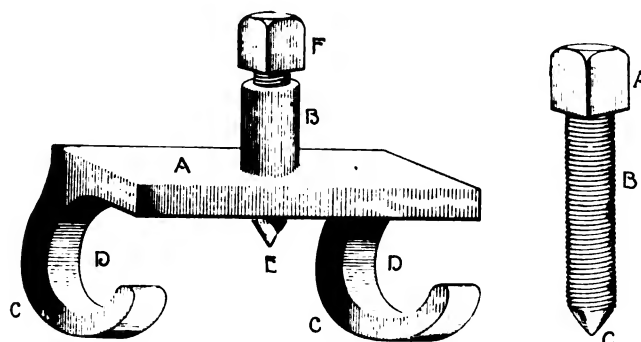


FIG. 1.

FIG. 2.

point, hardened. Fig. 3 shows a piece of harness leather, with openings A, A, through which the hooks C C, Fig. 1, can be slipped so as to permit B to be on the inner side of the hook, and thus be in contact with the rim when the tool is placed on the rim. If the bolt turns we hook C C on to the rim, and then, with a wrench, set the



FIG. 3.

screw point down onto the head of the bolt, which will prevent its turning while removing the nut. Make the clamp of mild steel and the screw of crucible steel, with the point tempered sky blue. One will be required for buggy and phaeton wheels, and others for the heavier grades.

HINTS REGARDING WIRE WHEELS.

COVERING A WIRE CYLINDER.

A WIRE cylinder is an important tool in the wire wheel repair shop, and we give herewith instructions to cover them. One of the best coverings to be used is made of a woolen center, with a strip of calico glued to either side of it. Another is made with linen and cotton facings, and a woolen center. Both of these are filled with needle-pointed steel wire of the finest quality, and will stand an immense strain before they will break. This is necessary, as a good clothing should be firmly attached or it will soon get loose and blister. Sometimes rubber clothing is used.

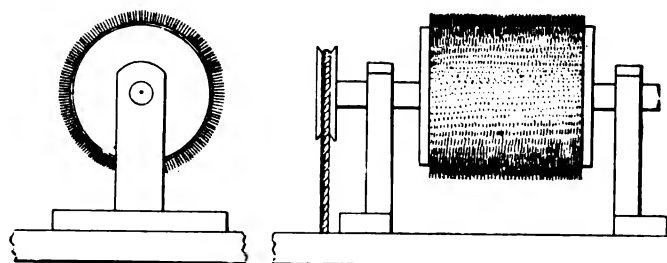


FIG. 1.

It is best to unroll the clothing and put it in a barrel, so that when it is ready for use it can be easily handled, and it unwinds better than if left in the roll. It also dries the clothing if it has been in a damp place. If clothing is kept in a cold place it will become stiff and hard, and if put on in this condition the wire will soon break out and render the clothing useless. Always keep the clothing in a dry

place, for if kept where it is damp the wire will rust and the clothing will be destroyed before it is put on.

WIRE CYLINDER.

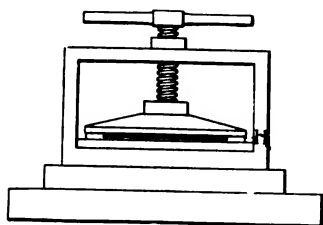


FIG. 2.

around them in a short time and a good fillet will soon be transformed into a very poor one. Daub the back of the clothing with plenty of graphite to lubricate it, and give it a smooth, even slide.

Fig. 1 shows a good form of wire cylinder for general smoothing and burnishing service, the end and a side view being shown, also the plan of the rope pulley drive.

An ordinary screw letter press, Fig. 2, is a very useful instrument in the wire wheel shop. Many of the metal parts of wire wheel connections permit of slight bending, and this may be done by placing the article beneath the plate at H.

A slow, steady pressure can be obtained and bent pieces straightened easily.

Workers on wire wheels are frequently required to restore worn bearings to their former shape.

To babbitt worn parts first turn down the steel shaft, and then form a metal surface about it, on the plan indicated in Fig. 3, in which the process is similar to rebabbiting a common machine shaft journal and its core. The casing, E, is formed about the worn portion as shown, and a funnel, F, inserted, through which melted

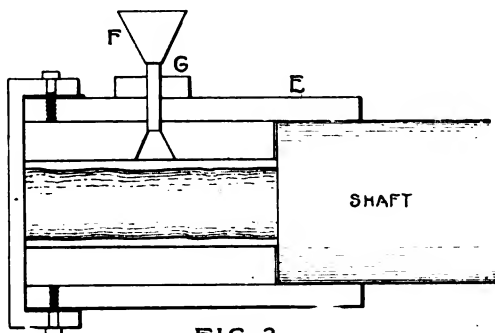


FIG. 3.

babbitt is poured until the space is filled and the bearing, G, made even. Then it is polished on a fine emery wheel, and finally with oil and emery.

The matter of oiling is of much importance, and all practical workers on wire wheels know the benefit of a good oil at the bearing. The essentials for a good lubricant for wire wheel bearings are sufficient fluidity to secure thorough distribution, body enough to prevent its running, freedom from gumming, staying or non-evaporating qualities, and above all, the absence of any ingredients that would have an injurious effect upon the metal bearings. A loose bearing will cause chattering of the parts and of the journal, resulting in heating, even if the best of oil is used. If the bearings are loose or worn, rebabbit them as above described, or put in new ones.

It is not possible that the classical spirit should ever take possession of a mind of the highest order.

Paint Department.

THE EFFECT OF HEAT ON VARNISH.

THE writer contends, although his statements have been disputed by many good painters, and will be, no doubt, as long as the painting business is conducted on lines as it is at present, that varnish may be subjected to heat many degrees above 100° Fahr. in the drying process without detriment to it, but instead that heat is really beneficial to varnish when drying. Also, in order to get the best results with varnish, that the drying room should be heated artificially, for the reason there is no varnish that dries alike in different temperatures, high and low, moist and dry; also, that nearly all of the so-called devilties of varnish may be eliminated by using a drying room in which a uniform high temperature may be maintained.

It is queer how some of the old time painters still cling to the methods which were in use when they were boys when it comes to using varnish. After long arguments, and convincing practical proof, they are sometimes willing to adopt other methods of painting, other roughstuff, or other color; or they may be willing to reduce the number of coats; but when it comes to changing the old way of applying and drying varnish, never. It won't do to meddle with the varnish coats. There must be just so many. Each coat must be allowed just so long a time to dry. And all the other empirical rules which govern its use, and which have been brought down from generation to generation, must be rigidly observed. Time honored methods are all right when they are perfect within themselves, and when they meet all of the requirements of the present time; but in a case like that of varnish, where there are so many vagaries, and which so often goes wrong, its own action is evidence that there is room for improvement. Anyone who has had to do with varnish knows that a coat of it will not dry in a cold, dark, damp atmosphere as well as in a warm, light, dry one. Heat and light cause a dry atmosphere. If varnish dries best in such an atmosphere it becomes evident that heat is beneficial to it up to as high a degree as it will stand. It can be proven that varnish, in drying, will stand a high artificial heat. A good finishing varnish will stand and dry in a temperature as high as 350° Fahr. The finest finishing and rubbing varnishes may be dried in a temperature of 150° Fahr., and come out with a brighter luster than when dried in an ordinary temperature of say 70° Fahr. Furthermore, varnish dried by artificial heat will retain its luster longer, while it will remain comparatively free from checks. The reason it does not check is because, after it becomes cool, it never again reaches the temperature in which it was dried. But when it is dried in an ordinary temperature, if it is afterwards subjected to a higher temperature it softens up, expands and contracts, then checks. This is only the writer's theory. Whether it is correct or not the fact remains, that varnish dried at a high artificial temperature does not often check. When it does, the fault may nearly, if not always, be traced to defects in the process.

It would be unsafe to use varnish on veneered work, or work with glue joints, in a room with the temperature so high as to affect the glue, but it could be used in a temperature of 100° with much better results than in a temperature of 70°, as is generally the case. A temperature of 100°, without there is steam in connection, is always a dry temperature, while a temperature of 70° is often moist. A temperature of 100°, when caused by artificial heat, cannot be otherwise than a dry temperature, for a hundred degrees of heat would drive out moisture as far as it is possible to drive it out, for there is more or less moisture in any degree of temperature.

The writer claims the perfect drying of varnish is due altogether to the condition of the atmosphere. And the dryer and hotter this temperature is the better and more securely the varnish will dry. There is no reason why carriage makers should not varnish their work in as high a temperature as it will stand. If too hot for men to work, to varnish in a room with the temperature as high as they can stand, and put in another room with a temperature as high as the work will stand, to dry.

Several advantages would result from such a proceeding. Where it takes days for a job to dry it would take a much less time, even if the temperature be only 100°. On account of turning out of the work quickly less working room would be required, two very important considerations.

Carriages varnished and allowed to dry in a temperature of 70°, when subjected to the hot summer sun, when the surface, on account

of reflection, immediately rises to a temperature several degrees above 100°, are bound to check. They can't help it. The quick expansion and contraction of the partly dry varnish will check it every time. Then to further the checking, some persons have the insane idea that water applied to a varnished surface before it is put in use will increase its brilliancy. Often it is done in a hot sun, with the water at least 50° lower than the surface. It has been demonstrated by experiment, by taking two boards, each surfaced alike, ready for a coat of varnish, and using the same varnish, that to dry one in a high artificial temperature, and the other in an ordinary summer temperature of 80° in the shade, and exposing them to the elements, that the one dried in artificial temperature does not exhibit any perceptible checks, while the other in time is crossed and recrossed in all directions with them. The varnish on vehicles will become checked on account of the strain on different parts. There is no way to avoid this as they are now constructed. The long cracks over the steps are undoubtedly



FIG. 1. Munn's envelope wagon. Entire body coach madder red, with heavy gold stripes. Lettering gold, fine lined white and yellow. Trade mark in colors.

due to the extra weight thrown on them at times by passengers getting in and out. If they were allowed to dry in a room of which the temperature is higher than that of the sun to which they are subsequently exposed, the checking and cracking of varnish would without doubt be reduced to a minimum.

It has also been demonstrated that varnish, to give the best results, should be exactly of the same temperature as the surface on which it is put. This may not be disputed, although it is done every day. Varnish much warmer than the surface will crack sooner than when much colder; a few degrees difference would not make any difference in cracking, but both should be as near the same temperature as possible. It would be quite impossible, perhaps, in everyday work to get and keep a fluid and a solid surface at the same temperature.

The idea of washing a varnished surface with water to make it brighter is erroneous. No doubt it does so for the time being. If it does so, then water acts only as a stimulant. The use of all stimulants, whether by an animate being, or on an inanimate object, is reactionary. The excitement is always equalled by the depression. And varnish is no exception. A frequently washed surface goes dead quicker than one that is not.

After all is said and done, it is not so much the fault of the painter that a job cracks, as it is of the care given it by the owner, but painters should acquaint their customers with how to care for a vehicle. There are many who would, but they don't know how. It would be a good idea for the job shop painter to have a slip of rules printed, so paste in some part of the job, how to care for it. Such little things sometimes do a great deal of good, from the fact of showing interest in the work.

THE PREPARATION OF FOUNDATION COATS.

WHEN we come to fully appreciate the fact that a single weak link in the chain of foundation coats works utter failure to the whole paint structure, then perhaps we shall be quite willing to put aside forever the old crude notion that the strength of a majority of coats will counteract the weakness of the minority. Again and again is the fallacy of this argument exposed. And yet, in this loud, almost brutal competitive era, men swallow the argument seemingly without a prick of the conscience. They ignore all just rules of painting, and when failure does come, as it must, they profess a great show of innocence and freedom from all responsibility.

If the bricklayer should choose to now and then place a poor brick,

or inferior mortar, in a wall, you would condemn his workmanship at sight. If the blacksmith should forge a poor link in the chain you would promptly remind him that a chain is no stronger than its weakest part. And so you might traverse the whole line of industry, pointing out the failure that inevitably comes from omitting certain clearly defined safeguards which belong to, and are a part of, all mechanic arts.

Take the priming coat, for example. Around the average carriage shop it is a common thing to hear painters bravely declaring that "anything, so long as it has oil in it, will do for the priming." The absurdity of this contention is best shown by quoting what our good friend, Charles E. Copp, of the Boston & Maine R. R., has to say about priming—and Mr. Copp generally knows what he is talking about. "Here are ten monkeys suspended from a tree, all in a string, by holding onto each other's tails. The first one, you will readily admit, must have a good grip on the tree's limb, and have the requisite strength to hold them all. Precisely so must your priming have the necessary hold upon the wood, and the requisite tenacity to hold on, or you will prove yourself to be the greatest monkey of the lot by mixing and applying that which would not hold the succeeding coats which were attached to or laid over it."

From this illustration it is plain to see what a stout, crab-like grip the other coats must have upon each other to make the whole foundation symmetrical, of uniform strength and value. There are no "least important" coats in the united whole. All are alike important. Each individual coat is dependent for its strength and its stick-fast power upon that of all the others. In union there is strength, but the strength depends upon the stability of each separate unit.

While it is granted that the proper application of pigments to the surface has largely to do with their usefulness as surface protectors and beautifiers, it must likewise be granted that their preparation is a matter of the utmost concern. A traditionally good all round priming is made of pure, finely ground keg lead, thinned to a stiff paste in raw linseed oil, and with lampblack deepened to a lead or slate color. Then, to a quart of this paste mixture add one gill of coach japan. Following this add more oil, until the pigment is reduced to the nature of a stain in the oil. For strictly hard wood, make the lead to thick paste in oil, then cut to a brushing consistency with turpentine, and again thin out with about one-fourth more oil. This turpentine addition will render the priming more fit to overcome the negative property of the hard wood surface. A second recipe is: Keg lead, 3 lbs.; lampblack, 2 ozs.; raw linseed oil, 1½ pints; turpentine, 7 pints; coach japan, 1½ gills.

Recipe No. 3 is one largely used in factory shops, and is as follows: Keg lead, 2 parts; yellow ochre, 1 part; raw linseed oil, 2 parts; rubbing varnish, 1 part; turpentine, 1 part. To each quart of the mixture add a gill of japan.

For what is known as first lead, shade the lead to slate color with lampblack and add 3 parts of turpentine to 1 part of oil. If using oil ground lead, just as it comes from the keg, simply thin with turpen-



FIG. 2. Grocer's wagon. Main panel, invisible green; belt panel, pea green; lower panel, maroon. Script lettering on upper panel, gold, green asphaltum shade. Lettering on belt panel, gold, shaded Indian red, split with carmine; that on lower panel gold, shaded with fine line of orange and yellow. Scrolls on main panel silver, with green shade, striped fine line orange and yellow.

tine, as there will be a sufficiency of oil. For the next lead coat, which, in these later years, has come to be denominated "dead lead," use only enough oil to act as a binder for the lead. That is to say, a tablespoonful of oil to a pint of the lead, adding a teaspoonful of japan to the same.

Rub lead consists of finely ground dry white lead, shaded to a

Trimming Department.

CARRIAGE CLOTHS FOR 1900.

light gray color with lampblack, the pigment being mixed to a brushing consistency with linseed oil (raw) 3 parts; coach japan, 1 part.

Putty is variously compounded for carriage uses, but the best putty known to the carriage painter, the one he has held fast to with tooth and nail through all the changing years, is made of dry white lead, colored to meet individual needs, and rubbing varnish and japan, equal parts.

Roughstuff recipes: No. 1: American filler, 3 parts; keg lead, 1 part (these proportions by weight). Reduce to a stiff paste in rubbing varnish and japan, and thin to the proper brushing consistency with turpentine.

No. 2: American filler (by weight) 2 parts; keg lead, 1 part; elastic rubbing varnish and coach japan, equal parts. Mix to a very soft paste with above liquids, and thin to the right consistency with turpentine. Apply one coat per day.

No. 3: English filler, 4 parts (still by weight); keg lead, 1 part. Stir to a paste in rubbing varnish and japan, and thin out, as usual, with turpentine.

English filler is a more compactly textured filler than the American article, and requires, as a rule, less lead, surfaces down very fine and firm, but rubs proportionately slower.

THEY ATE, DRANK AND WERE MERRY.

THE Carriage and Wagon Builders' Association, of Philadelphia, enjoyed their fifth annual banquet on March 21. It took place in Odd Fellows' Temple. At this annual gathering the members bring their wives and sweethearts, whose presence lends enchantment, and does much toward cementing the good feeling now existing among the gentlemen of the association.

August Geissel, Jr., president, made the opening address of the evening. He was followed by Z. Taylor Rickards, who holds the distinction of having been the first president of the Philadelphia Association. Mr. Rickards made an impromptu speech, which was ably as well as humorously rendered.

After enjoying the delicacies of the season, the diners were entertained by a German comedian, tramp juggler, banjo player, several singers and witty specialists. One of the features of this part of the entertainment was the able manner in which a child rendered several pieces of elocution. She was a daughter of Frederick W. Seese, one of the ex-presidents.

The entertainment committee deserve a vote of thanks for their zeal in making the affair the most successful of banquets. Harry Keachline, secretary, and Frank Schanz, treasurer, two of the most popular and hard working members in the association, provided a palatable collection of edibles and an appropriate collection of technical synonyms or *nom-de-plumes* for the menu card, as our readers will see below. August Haedrich, to whom was left the engaging of the performers, selected a very good array of talent and did his duty well.

The concert concluded with two songs rendered by the *gesang-verein* of the association, and then all went home.

MENU.

Blue Points (Chisels, files, needles).		
Celery	Olives	Pickles
(Head Lining).	(Bronze Green).	(Brewster Green).
Bouillon en Tasse	Haut Sauterne	
(In Felloe Plates).	(Top Dressing).	
Sweet bread Cutlets	French Peas	
(Third Coat of Filling).	(Ball Bearings).	
Tenderloin	Mushrooms	Amontillado Sherry
(Grain Dash).	(Canopy Tops).	(Wearing Body).
Potato Croquettes	Deidesheimer Rhein Wein	
(Oil Putty).	(Roughstuff).	
Roast Squab	Lettuce and Tomatoes	
(Smooth Face Duck).	(Green Satin and Red Tufts).	
Water Cress	Assorted Fruit	
(Moss).	(Stump Joints, Cock and Eyes, Knuckles, Axle and Nuts).	
Fancy Cakes	Ice Cream	Coffee
(Cotton Wadding in Shaft Boxes).	(White Lead).	(End Gate).

PRICES ADVANCED.

It was announced on March 26 that, as a result of the conference at Chicago a few days before of the manufacturers of wagons, carriages, etc., an average advance of 20 per cent. over the old scale is now in effect. The blame for the necessity of making the increase is put on those who furnish the wagon and carriage concerns with material for the construction of their output.

A VISITOR to the various carriage cloth houses in New York City will wonder, after looking through the samples, how the carriage manufacturer of years past managed to get along with the limited varieties of cloth from which he was compelled to make his selections, and furthermore, the builder will find it a severe test of his ability to select colors and tone, when he attempts to lay in a stock for his regular lines of work, and the painter, when mixing his colors, will find his skill and sense of color taxed to the utmost to match the colors and tones. The selection of cloths should be made by experts, as there are so many that by themselves are new and pleasing that buyers will be tempted to stock up and then to use them indiscriminately, and the result will be many inharmonious combinations. The manufacturers of special vehicles will be able to use them to an advantage, as the colors selected for the paint are all decided, and cloths can be chosen to harmonize with the painting. Then there are shades of gray which are so near the neutral that they can be used with any color paint, and others that from strong contrasts can also be employed; but it requires a well trained eye to make a success in this selection and harmonizing of colors of cloth and paint. Just here we wish to say to the carriage builder that if he hopes to obtain satisfactory prices for his vehicles he must trim them for special markets. This is notably true of such as are sent to eastern and the larger western cities, where buyers are critical as regards the details. Many an otherwise satisfactory carriage has remained unsold for a year or more, simply because of the unsatisfactory color or quality of the cloth. Incongruous colors do not interfere so much with the sale of low priced vehicles as with medium and high grades, but even this fact is not a satisfactory excuse for such disregard of harmony as is shown in the colors of much of the cheap work. It costs no more to use harmonious colors than it does to use those are otherwise, and it is a reflection on the intelligence of the buyer as it is evidence of carelessness of the builder, to put out vehicles that are simply patches of color.

There never was a time when the fancy cloths were so popular as they are at present, and they can be had in weights from 8 oz. to 22 oz. Whipcords being more popular than Bedfords, it offers an opportunity that is embraced by many to purchase those made for clothing, instead of the strictly carriage cloths. The latter have a different finish than the former, so slight, perhaps, in some cases as to escape the notice of the average buyer, but, as they do not stand the wear so well, they, in the end, prove less satisfactory. Eastern builders confine the use of whipcords and Bedfords mainly to no top driving vehicles, traps, carts, breaks, drags, runabouts and kindred styles, giving preference to light or dark cloth for vehicles with leather tops, and dark cloths for close top carriages, such as broughams, landaus and coaches. Western builders are less particular in this respect, and with the exception of those who cater to the eastern market use all kinds indiscriminately, regardless of the character of the carriage. This may answer in some sections, but a closer attention to the selection of kinds, colors and grades of cloth would accrue to the benefit of the builder and to the pleasure of the buyer. In days past the man was the buyer, but the twentieth century woman has changed all this, and now the man's part is to give his check for the carriage that the feminine members of his household have selected. The builder may say that this is of no real importance to him; so long as he sells the carriage, he doesn't care who selects it; but it does make a difference. The women who are carriage buyers are, as a rule, women who possess a keen sense of taste in color and a knowledge of fabrics, which makes them critical buyers, and they will have their own way in those matters, and the manufacturer who may hope to gain their trade must be an expert in color harmony, and must produce pleasing effects in cloth and paint, or the female buyers will leave his product alone. The automobile is becoming an important factor in the cloth market; for these the demand has been largely for fine qualities of cloth or morocco. Latterly there has been developed a disposition to select less expensive cloths, and to a limited extent leather instead of morocco. When this has been done, the leather selected has been second quality, and we are of the opinion that those who use it will find that they have made a mistake, as it will, almost to a certainty, soil the garments of riders.

As we have said, the variety of cloths and fancy fabrics is very great. The volume of sales is greatest with cloths. These run from 5 to 24 oz. in weight, and are furnished in a variety of colors; drabs are numerous, and shades delicate. In price, quality for quality, they are the most expensive goods in the market. Then there are the maroons; these have found favor with some builders for one man wagons, runabouts, pneumatics, and light drags. Although used less than other colors, they afford a pleasing variety. The whipcords are more numerous than ever before. Some of the novelties are very showy. The newest is the check whipcord, a novelty that will attract the attention of buyers who are on the lookout for something new and neat. Then there are numerous other weaves, and an almost endless array of colors. In cloths, green, blue, maroon and black are used, the leader in color being green, a popular high grade being the "forester."

The importance of looking well to the cloths is being appreciated by all up-to-date manufacturers, and many who heretofore were governed by price rather than quality are now purchasing the finer grades. There are a few houses that cling to the cloths of a quarter of a century ago, and their orders of to-day are duplicates of those for decades back. Cloths, that is, those having a nap, are used more than the whipcords, Bedfords, etc. They can be had of almost any weight from 5 oz. up, and at rock bottom prices, and find a place on the \$35 buggy and in the \$1,500 brougham. They, therefore, represent the extremes, the low quality being about as poor as it is possible to make, while the upper qualities are the finest products of the loom. The demand has been unusually heavy; leading houses report their sales in excess of those of the corresponding period of last year. Some of this is due to the call from automobile builders, but the greater part is from the carriage trade. Prices have advanced, and are likely to remain so for the season. The one element in over supply was due to mills engaged in making clothing cloths running on carriage cloths to keep their works at work, but the demand for clothing cloths has been such for almost two years that the carriage end was dropped, and the stocks are now down to a normal basis, and there can be no overloading of carriage goods for a year to come at least. This fact clears the road for carriage cloth buyers, as they can count upon stable prices. From what we can gather, the variety of cloths and fancy cords, etc., will be one of the features of the specialties in carriages for the coming season, and the man who hopes to find market for his novelties will have to look well to the trimming, as the gentleman as well as the lady will leave his best product to buy one that may be a little inferior in some respect, but will be better trimmed.

TRIMMING FOR A SASH-DOOR DEPOT WAGON.

THE accompanying illustrations show a plain but very neat design of trimming for a sash-door depot wagon. Each of the illustrations is drawn very plain, but they do not explain themselves; they merely show the simple tracing of the design. There are several new ideas and points suggested throughout the design that will require the reader's careful attention to the explanation in connection with each sketch. The most suitable material for this class of work is blue cloth, with seaming and pasting laces and worsted tufts, without broad lace. Figs. 1 and 2 represent the back and side quarters.

To make the back, draw muslin over a frame, cut a piece of buckram to fit the top of the back, with $\frac{5}{8}$ in. fullness to tack over the top, also to fit neat between the side rails at the back pillar, and 2 in. scant at the bottom of the seat for cushion space. Paste the buckram on the muslin. Draw the two lines across the back 5 in. from the top and bottom, and space off for the tufts not over $1\frac{3}{4}$ in. apart; it is well to draw the tuft lines on both sides of the rough lining and mark for the tufts on the back part. Tack out a piece of good muslin on the bench, free from creases or fullness; draw a center line down the muslin, and from that line square off the bottom, giving 1 in. fullness to the muslin between the bottom edge and the first line of tufts, and $1\frac{3}{8}$ in. at each corner, or end, between the two lines. This line has the sweep of the top of the back, and $2\frac{1}{2}$ in. is given between the upper tuft line and the top of the back; a sufficient amount of the muslin is allowed at the ends of the back. Baste the muslin down to the tuft lines, also to the bottom and top edges; leave the ends open. The muslin must be kept taut and basted firmly with a long back-stitch, and when the four lines of bastings have been made, the center line on the muslin should lay on the center line on the buckram. Both care and judgment must be exercised in filling the pad up. The hair must be placed in very regularly and smooth, as any careless

work done to the pad will show on the cloth. Work the ends up full to the other part of the pad, and baste the muslin to the buckram.

Line the cloth with thin sheet wadding, and draw it over the pad taut crosswise; this is done by means of a good stitch at the center and the end of each tuft line. Work down the cloth along the tuft lines before drawing in the tufts. Fasten the tufts with a small nail

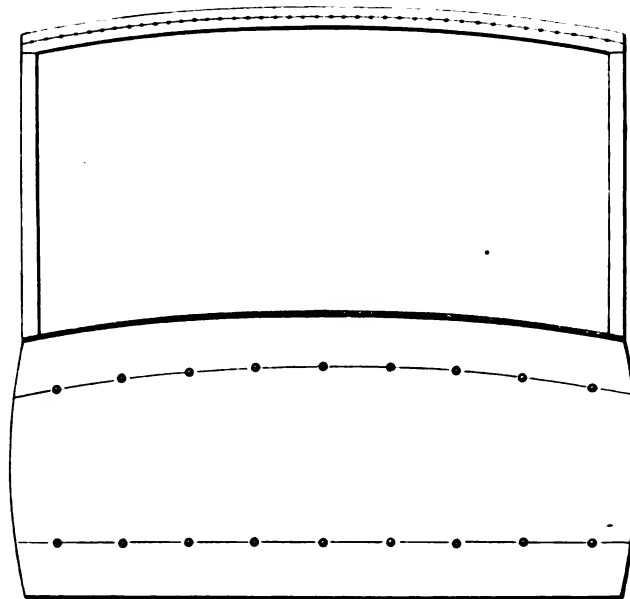


FIG. 1. BACK.

through the eye on the back of the rough lining. Baste the cloth around the edges and trim off close to the buckram. Finish the ends with seaming lace and plain cloth. Finish the bottom edge with pasting lace. Cover the trimming piece at the bottom of the back with black canvas, and draw a chalk line $2\frac{1}{4}$ in. from the bottom across the block for the bottom of the back, marking the center of the block, also the center at the top of the back.

Cut the back from the frame, and tack the $\frac{5}{8}$ in. at the top over on the wood, commencing at the center and drawing taut toward the back pillars. Leave the end seaming lace long enough to finish

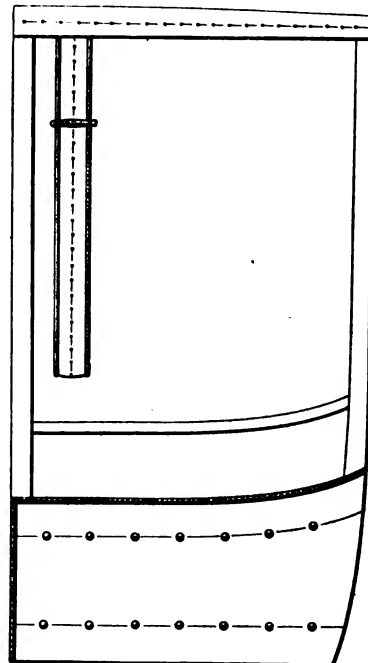


FIG. 2. QUARTER.

around the pillars; tack the bottom of the back along the chalk line with black lining nails. Fill in between the rough lining and the panel with moss or other cheap substance from the ends of the back; finish the ends along the pillar with seaming and pasting lace.

Make up the tufted quarter in Fig. 2 on a stiff rough lining, and give it much less fullness than is given to the pad. Space the tufts $1\frac{1}{2}$ in. apart. Do the rest of the work in the same manner as the back.

The eve rail bands are in three pieces, the side pieces extending from the back to front pillar. They are made with buckram and canvas, well pasted together, and are $2\frac{3}{8}$ in. wide. Sand off the face of the buckram with block sandpaper; draw two lines through the center of the band $\frac{3}{8}$ in. apart. Paste sheet wadding on the band, applying the paste below and above the two lines. Cut the wadding away from the two lines, and paste the cloth down on the lines. After the paste has set along the lines, draw the cloth over the wadding and paste it down on the back of the band; the edges of the cloth ought to meet above the center of the band. When the paste is dry, stitch the two center lines on the machine. Fasten the bands to the eve rail with cloth-covered nails 4 in. apart, near the top of the band.

Make the swingholders on a plain piece of duck canvas, cut $2\frac{3}{8}$ in. wide, with two center lines $\frac{3}{8}$ in. apart and a line at each edge $\frac{1}{4}$ in. space. Paste the cloth on the center lines and along the $\frac{1}{4}$ in. space, leaving the cloth loose over the spaces between the stitching lines; paste the cloth over on the back of the canvas, with the edges joined above the center of the same.

Cut the cloth for the holder $5\frac{3}{4}$ in. wide; lay a 3 in. strip of thin wadding on the cloth, fold the edges over the wadding and join them together with light sewing cotton. Tack the cloth and wadding out on a board, stitch the two center lines on the made lace, and then

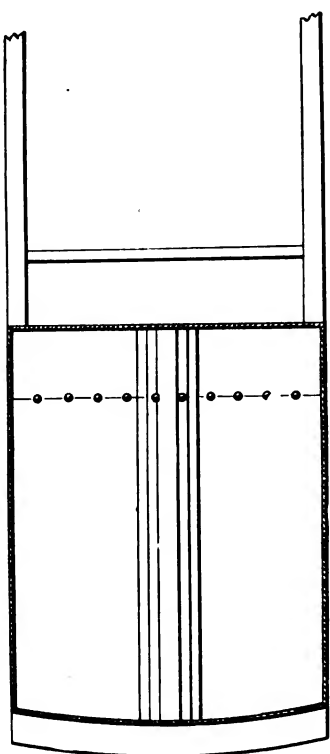


FIG. 3.

paste on the lining and stitch 3-16 in. from the edge of the made lace. Fold the holder and screw the frog on from the outside with small silver head screws. Put the holders in a press until wanted for the job.

Fig. 3 represents the style for trimming the door, which is very simple, and quickly made up. Make up the lining on the door without a rough lining. Fold the cloth at the center with a 2 in. box plait, with two single plaits 1 in. wide on each side of center plait. Press down the plaits with a hot iron and baste along the tuft line; fold the cloth at the tuft line and stitch near the edge of the fold. Lay two or three layers of thick wadding on the lining board, tacked here and there to hold it in place. Cut the wadding through along the tuft line and draw the cloth taut along the line between the cut in the wadding, and drive tacks at each tuft mark. Draw the cloth taut over the wadding each way and tack to the edge with small tacks, close together. Finish the top of the door with seaming and pasting lace, and the sides and bottom with pasting lace only. Cut off the eyes of the tufts close to the tin, and make a small hole through the tuft with bench awl; fasten the tuft in place with a suitable nail, sinking the head of the nail into the tuft with a small nail punch.

(To be continued.)

THERE is never vulgarity in a whole truth, however commonplace.

AN OPENING FOR AMERICAN CARRIAGE BUILDERS IN INDO-CHINA.

ALTHOUGH American manufacturers of carriages and carriage parts have shown, on the whole, creditable energy in penetrating foreign markets, there are still many countries where little or nothing has been done by Americans toward capturing the lucrative markets that are at present supplied with indifferent goods by European countries. A large number of these markets are scattered throughout the East, and chief among them is Saigon, the capital of French Indo-China. As a rule, we are accustomed to look upon this country as too small to be worthy of any particular attention being paid to its trade, but when it is considered that Indo-China has practically no home industries, and, in consequence, is obliged to look abroad for the great bulk of its supplies, it may readily be seen that the local conditions are in favor of the building up of a large import trade.

These conditions are particularly true in the case of the carriage trade. Although Saigon possesses four or five carriage builders the entire industry of the country consists practically in putting together imported parts, and to a certain extent in constructing bodies. According to advices emanating from reliable sources in Saigon the carriage trade is steadily on the increase, and the importation of axles and other parts is making great strides to keep pace with the demand. Heretofore, it seems that France has succeeded in monopolizing the import trade, owing for the most part to the lack of competition, but of late several Saigon manufacturers have evinced a disposition to investigate American manufactures in the carriage line. A few vehicles of American design, especially two-wheeled conveyances, have already made their appearance on the streets of Saigon, and have found widespread favor among the European residents of the colony, as well as among the higher classes of natives.

At present the general demand for carriage parts, especially axles, in Indo-China is for the ordinary grades, similar to those to be found on the markets of China and other Oriental countries where the bulk of the people are not in a position to pay the prices asked for high grade goods. The general run of axles imported from France sell for about \$5 apiece.

The prices brought by carriages that are put together in Saigon are medium. For example, four-wheeled carriages, such as victorias, mylords, vis-à-vis, etc., bring at a minimum from \$240 to \$300, while two-wheeled carts sell at \$100 and upwards. \$100 is the minimum cost; prices run up from this to almost fabulous sums, the wealthy members of the aristocracy often paying immense amounts of money for imported carts of original design and showy appearance.

In regard to wheels for carriages it may be mentioned that a considerable quantity are manufactured on the spot, but of such crude construction are they that only the lowest grade wagons are fitted with the domestic product. The indications are that a good export trade of wheels of American make could be built up between this country and Saigon, since the reputation of American-made wheels for solidity is already well known to the domestic builders. The dimensions of the wheels now most used are, for front wheels, from 2 feet to 2 feet 5 inches, while the rear wheels measure from 2 feet 7 inches to 3 feet 3 inches. In the case of tilburys, charretts, dog carts, etc., 3 feet 3 inches to 3 feet 7 inches are the usual sizes. The average length of the axle arm, on the other hand, is $5\frac{1}{2}$ to 6 inches, the diameter being 1.18 inches.

Saigon buyers of such accessories as axles, springs, wheels, timbers, poles, etc., partly import their supplies direct, but as a rule purchases are effected through agents on the spot, the terms of payment being the same as those in practice in other Oriental countries. The Indo-China import duty on parts is classified as follows: Axles, \$2.72 per 220 pounds; springs, \$4.32 per 220 pounds.

In connection with the above we will be pleased to furnish such of our subscribers as may wish them, a list of the names of the Saigon manufacturers to whom the bulk of the imports of carriage parts into Indo-China go.

PROMPT COLLECTIONS.

PROMPT collections on the part of the jobber compel the retail dealer to attend strictly to business, prevent his spreading out, cause him to use the greatest care in trusting out his goods and to make his collections with promptness, reduce to minimum the danger of overreaching himself, or, in other words, compel him to do a legitimate, conservative business, and to get a profit on his goods and keep his expenses within proper bounds.

COLUMBUS, OHIO.

THE carriage industry in this city is showing much more activity this spring than it has for several years, and business for the spring bids fair to assume somewhat the proportions attained in the early nineties, before the panic came on with its disastrous results. All the factories are running with a full complement of employees, and some of them are already doing some night work. Shipments with a majority of them have been backward for the past few weeks, however, on account of the extremely bad weather, the retailers being unable to move stock and requesting that orders be held until they could clear up a little. The prospects were never better, notwithstanding this, and there will be an immense amount of high grade vehicles sent out during the next few months. Buyers are showing a preference for better goods than they have for some time and are more liberal in the matter of prices, hence there can be but one result—an increase in the volume of business, which, of course, means an increase in the net profits at the end of the year.

The Columbus Buggy Co. will have probably the only display of carriages at the Paris Exposition. The jobs to be sent there for the inspection of the visitors from all parts of the world have been completed for some time, and were shown to the public at their repository some time ago. The display consists of a typical American end-spring buggy, an open cabriolet, a phaeton and a boulevard wagon, all rubber tired vehicles. They are made up in handsome style, and will be indeed a creditable representation of American carriage building. It will be in charge of Henri L. Couteron, a native-born Frenchman, who has been in this country about six years. The company's factory is now running twelve hours per day, and orders for this time in the year are at least 40 per cent. in advance of what they were in 1899. The prospects for a continuation of prosperity in this line are the very best.

The Monarch Vehicle Co. is making a run on open stick seated surreys and pneumatic runabouts. They have found a good market for them, and will devote considerable attention to the two lines the coming season. They are also putting out a nice line of phaetons and other vehicles. They are proprietors of the Columbus Rubber Tire & Supply Co., which is handling the Kelly tire almost altogether. For these goods they have charge of the city trade and are doing a good jobbing business.

The Buckeye Buggy Co. report a good trade in a general line of high-class work. This company is paying considerable attention to the eastern business, and their returns from that direction are growing rapidly. They have recently put out a line of large cabriolets and station wagons on pneumatic tires, and have found a ready sale for them. The pneumatic tire seems to be taking especially well on all classes of vehicles this season, and many more of them will be shipped from this point than ever before. The factory has been wired for electric lights, and will work several hours at night hereafter until the busy season is over.

The Thorp-Kyle Co. has been incorporated to manufacture bent wood work for carriages and wood supplies for oil wells. The company is now constructing a factory on First avenue and Factory street, this city, which they will have in operation as soon as possible. They will employ between forty and fifty men at first, and will increase the force as fast as they are needed. H. A. Thorp, F. A. Thorp and H. G. Kyle, all of Akron, are the principal stockholders in the new company.

The Columbus Laminated Tube Co., incorporated some time ago, will make a line of wire wheels and ball bearing hubs for carriages, runabouts and automobiles. The company is now constructing a factory in the northwestern part of the city, and will start in a moderate way until they see what the demand will be. They expect to make a superior grade of tube for bicycles and other purposes.

The Parsons Vehicle Co. is making a line of specialties in the way of pneumatic traps and fancy vehicles, which are sold all over the United States. Their "Little Minister" is sold in London, also in Paris and some of the other large cities of the Continent. Their season's output will be sold up by June 1. Mr. Parsons says he will have a novelty in the way of a pneumatic road wagon on the market next fall which will create a sensation. It will be entirely different from any other yet produced, but he would not consent at this time to give out any idea of his new wagon.

The Scioto Buggy Co. reports a demand for a slightly heavier construction in light vehicles. The factory turns out a full line of carriages, buggies, phaetons and surreys, mostly made in three-quarter work. Up to this time the company has booked more orders

than in the same time last year, but because of unfavorable weather the shipments have been about the same. As soon as weather opens up, however, there will be a decided change in this respect.

Warren & Southwick have been making a specialty of fine delivery wagons and other goods in that line, and have turned out some handsome work. Since financial conditions have improved they have kept their factory running full time, and have some good orders booked for the future.

The Columbus Carriage & Harness Co. have greatly improved their factory in the south end of town, and have added an extensive harness factory as well. The repositories are full of new work now and about 1,000 finished jobs will be kept on hand all the time. This company sells its output through dealers and also direct. They are extensive advertisers in the magazines and periodicals, and have found that it pays them to spend money in advertising to customers.

John Immel & Son make a line of carriages, buggies, phaetons and other goods, and also execute special orders in the way of ambulances, patrol wagons, fine delivery wagons and high grade heavy wagons. Their shops are busy with spring orders.

Edward B. Kurtz, receiver for the United States Carriage Co., has filed his report of the business done in 1899 with the court. He has collected notes and accounts to the amount of \$17,000 in excess of the appraisement, and, notwithstanding the idea that prevailed to some extent that the company could not fill the orders received, the factories have had all their capacity would permit. The profit made for the court amounts to \$6,000. He asks as an allowance for his services for the past two years \$15,000, and for attorneys' fees, \$5,000. Upon an order from the court Mr. Kurtz has sold the property to Charles F. Myers, who was formerly interested in the company. The report shows the following figures: Cash received, \$155,066.86; notes receivable now on hand, \$41,090.56; total, \$196,197.44. Disbursements, \$128,027; cash on hand, \$27,039.88; furniture and fixtures, \$36.68; assets on hand, notes, \$41,090.56; account to C. F. Myers, \$5,187.48; cash, \$27,039.88; fixtures, \$35.60; total, \$73,253.60.

ST. LOUIS.

THE Implement and Vehicle Board of Trade, of St. Louis, Mo., held its regular monthly meeting at the Mercantile Club. Twenty-three members responded to the roll call, the total number present being thirty-one. J. R. Hickman spoke in behalf of the freight committee, explaining the effects of the various changes in classification. A resolution was adopted to the effect that men should be appointed to the consular service who understand the requirements of the export trade, and that the service be rendered independent of politics. The matter of future excursions of heads of houses was brought up. It was decided that future excursions be held under the auspices of the Board of Trade, and that the next excursion be run the latter part of April. It will be into Missouri and over one of two routes, either over the Missouri Pacific to Sedalia and back over the Missouri, Kansas & Texas, or over the Hannibal & St. Joseph and back over the Wabash. Which of the two routes will be selected will be left to the committee, which, as appointed by President Miller, consists of L. N. Burns, chairman; John D. Manley and John P. Camp. Three new members were admitted to membership, the Consolidated Rubber Tire Co., J. R. Hickman and the Sligo Iron Store Co.—*Implement Trade Journal*.

AUTOMOBILE CENTER.

SYRACUSE promises to become a center for the manufacture of automobiles. There are already three companies organized. The Anglo-American Rapid Vehicle Co. is experimenting with gasoline motors, the Century Motor Vehicle Co. uses the storage electric battery, and the newly organized New York Automobile Co. is to build a motor operated by combined gasoline and compressed air. C. Arthur Benjamin, representing the Locomobile Co., of New York, has leased the Dissell Building for show and sale rooms.—*Syracuse (N. Y.) Journal*.

DESTRUCTION OF THE WHITNEY WAGON WORKS.

THE Whitney Wagon Works, at the corner of Basin and Pond streets, Syracuse, N. Y., and the stables of the Zett Brewing Co., adjacent, were destroyed by fire on April 1. The wagon works carried a large stock and was but partially insured. The loss is estimated at \$100,000.

Ball and Roller Bearings Illustrated and Technically Considered.

EARLY in the history of carriage building the question of reduction of friction was recognized as an important matter. Felton, in his "Treatise on Carriages," published in London, England, in 1795, devotes several pages to axles. Among the illustrations is Fig. 1, which is a reproduction from the cut shown by Felton. It is designated as "The Patent Anti-Attrition Axletree and Box," of which he says:

"The advantages which this axletree and box are pretended to possess over the common sort are very great, principally lying in the great release given to the draft, the retention of oil, the ease with which it is replenished, the great security for holding on the wheels, and their durability. These axletrees, if made with the security, the wheels need no nut or linch-pin, as in those on the common principle; D, the arm of the anti-attrition axletree, represented whole at both ends to give different views of the reservoir, the strap washer and rollers, with the box on each arm, as horizontally cut through the middle. These axletrees at bottom are reduced from a perfect round, and grooved to receive two rollers, *c c*, on which the weight of the carriage is borne, in order to facilitate the motion. These rollers form the circumference of the bottom of the axletree, which is reduced to make the weight rest only on them. E, the reservoir, or concealment for the oil, being closely fitted and fixed by three bolts, *d d d*, on the back of the wheel-stock containing the oil within three recesses, *e e e*, which oozes through small channels on to the arm of the axletree, which it supplies for a considerable time. It is made of cast metal, and has a cap, *f*, projecting behind, which prevents the dirt from getting in. F, the wheel security, on strap washer. This has a collar *g*, which is placed within the wheel, between the reservoir and stock, and has fixed to the collar lugs a strap *b b*, which extends backwards some



FIG. 1. ROLLER BEARING AXLE OF 1795.

distance on the bedded part of the axletree, where it is fixed by a nut screw. By means of this strap washer the wheel is secured to the bedded part of the axletree. G, the cap, which is also fixed on the front part of the wheel stocks by three bolts, *d*, and by means of a screw plug *i* the axletree and reservoir is replenished with oil. H, the box, which is of the same form as the common box, only made of very hard metal, of a thickness proportionate to the weight of the carriage; this also shows how the axletree is supported on the rollers and prevented from bearing on the arms." We mention this to show that the production of roller bearings is not a new idea. The ball bearing, which, however, is but another method for obtaining the same results, is, so far as we know, a more modern idea and one that owes its development to the bicycle.

In the following review of the various styles of anti-friction devices we will, as far as possible, allow each manufacturer to state his own case, exercising the prerogative to eliminate all that will tend to reflect upon other methods. The primary object we have in view is to place before our readers a condensed, clear and concise account of the various principles involved, together with illustrations that will aid to make each clear. We begin with the Hyatt roller bearing, as it is the only one, so far as we know, that is constructed on the flexible roller plan. This plan is a novel and ingenious one, and a careful study of it cannot fail to reward the reader for his trouble.

AMERICAN ROLLER BEARING.

THE American Roller Bearing, popularly known as the A. R. B., is the only bearing of the roller type wherein the rollers are not supported and held in alignment by a cage, and in this respect is a radical departure from other methods. In this the rollers are held from touching one another by small separating rollers, instead of by the usual brass cages. The rollers have no pivots at their ends nor are they journaled in any way. The whole bearing is constructed of hardened steel, no soft metals of any kind being used.

The construction of the bearing is clearly shown in Figs. 1 and 2. These show a set of main rollers, that run in races in the hub and on the axle, which sustain all the weight. These main rollers are separated and guided by intermediate or separating rollers, which

sustain no weight, but are for separating and guiding purposes only. These latter are confined between the centers of the main rollers and project beyond their ends, as shown in Fig. 1; as they are thus held with their centers in the same plane as the centers of the adjacent main rollers there is no tendency toward the wedging of the rollers. The supports for these separators are purely rolling sup-

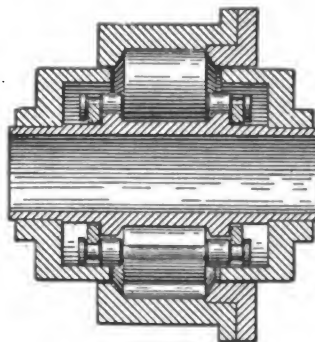


FIG. 1.

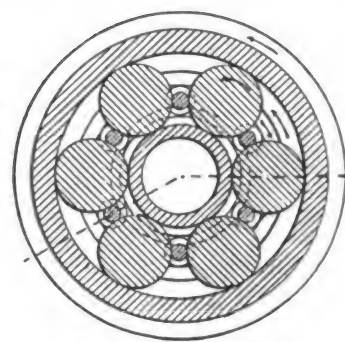
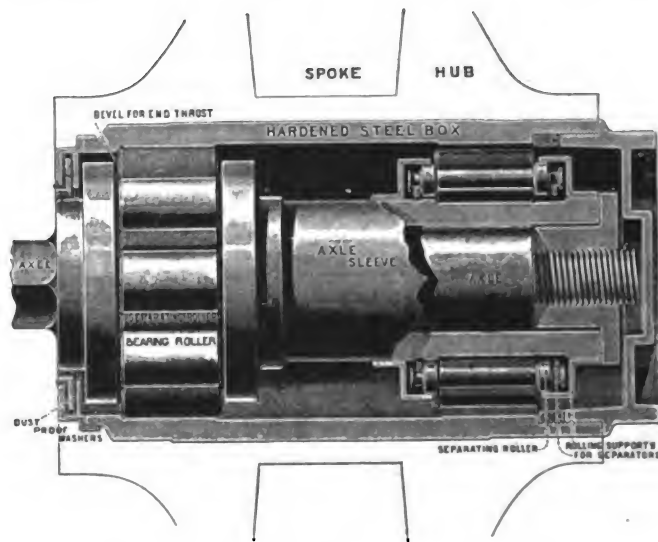


FIG. 2.

ports; that is, the enlarged ends, which project beyond the ends of the main rollers, roll upon the inner circumferences of the caps, *b*, which are fixed to the axle sleeve. These separators are also supported by the free rings, *a*, which run in the grooves in the projecting ends of the separators. The free rings, *a*, are merely driven about at will, so that there is no rubbing friction in this feature. The enlarged ends of the separators are so proportioned that they roll about the inner circumferences of the retaining cap, *b*, in perfect harmony with the main rollers as they travel about the axle; that is, the separating rollers do not have to be pushed along by the main rollers, but they are carried along harmoniously by the rolling action on their supports, *b* and *a*. Here there is absolutely no rubbing friction, but merely a pure rolling action. The action between the surfaces of the main rollers and those of the separating rollers is a purely rolling one, as will be readily seen, the separating rollers being turned in the opposite direction from the main rollers. This may be readily seen by noting the directions of the arrows in Fig. 2. The end thrust in the A. R. B. is taken up wholly by bevels, upon the principle of the flange in car wheels. This has been found much more efficient and durable than any separate end-thrust bearing, and



SECTIONAL INTERIOR VIEW OF THE A. R. B. AXLE.

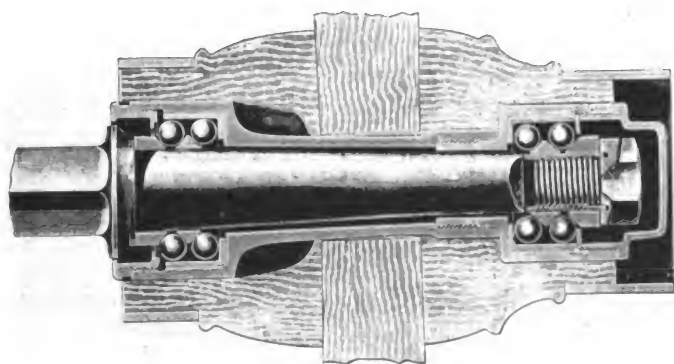
its simplicity gives it strength. The rollers in the A. R. B. are so short and stocky that all tendency toward twisting is avoided, yet they are long enough to prevent "rocking." With short rollers at either end of the hub box, the A. R. B. is never liable to the breakage which is common in bearings having rollers extending the full length of the box. Moreover, the A. R. B. uses rollers of much greater diameter than any other bearing designed for the same load. This aids in the strength and efficiency of the bearing. The separating rollers are of generous proportions, and nearly as large as the bearing rollers in many other types of bearings. Fig. 3 shows the interior of the box with rollers in position. To sum up, the A. R. B., with its perfect rolling action, its generous proportions, and its simplicity, is practically indestructible.

THE BAKER BALL BEARINGS.

THE United States Ball-Bearing Co., who manufacture and sell "the Baker ball-bearing axle," claim that they have a perfect anti-friction axle. This company has its principal business office in the Townsend Building, Broadway and Twenty-fifth street, New York. In its inception—in fact, before the company was organized for the purpose of manufacturing and selling these axles, they were put on heavy oil wagons carrying 13,000 pounds, for the purpose of testing not only the practical mechanical construction embodied therein, but also to demonstrate the ability of the company to make a ball bearing axle which would carry heavy weights—realizing that if they could make a ball-bearing axle which would stand up under such weights there could never be any question about its ability to carry the weights of smaller and much lighter vehicles.

The history of ball bearings previous to this company's inception is that they had been so mechanically imperfect in construction and so poorly made by the parties attempting to manufacture and vend same, that they proved worthless on all kinds of vehicles, particularly on vehicles intended for heavy weights.

On account of the failures on the part of some makers of ball bearing axles, many concluded that roller bearings would come nearer producing the desired results than the ball bearing. But the United States Ball-Bearing Co. claim to have demonstrated that they have an axle which is constructed upon such scientific principles



THE BAKER BALL BEARINGS.

and made in such a correct manner that it will work just as well on vehicles requiring a 5 in. axle as on speed wagons requiring only a $\frac{5}{8}$ in. axle.

For wagons designed for heavy weights they have a novel and a decidedly practical combination of two rows of balls in each end of the axle box, making four rows in each box. For delivery wagons requiring $1\frac{1}{4}$ in. axle and carrying 2,000 pounds, up to and including trucks carrying 90,000 lbs., they use nothing but this four row combination of balls on their axle. On vehicles carrying less weight they use the two rows of balls.

In order to make an anti-friction axle the United States Ball Bearing Co. contend that there are general principles that must be observed. First: The track of the balls must be fixed and certain. Second: This track must be so prepared that it will produce the least friction to the balls. If the track is not certain a great many unpleasant results are sure to follow, and the ultimate rejection of such axle seems inevitable. If the track is not prepared to produce the least resistance to the ball or roller as it travels over the surfaces it is impossible to have what is called an anti-friction axle.

In order to carry these principles into effect and to obtain the results desired in an anti-friction axle it becomes necessary to have a means of adjustment that is so practical in its character and so simple in its construction and application that the bearing can be perfectly adjusted at all times, if necessary, by anyone charged with the custody and care of the vehicle, otherwise it will be a question of a little while only when from wear of the parts rattle will begin and continue to increase until the bearing itself becomes worthless, and will have to be discarded. This is true whether it be ball or roller bearings. The adjustment must be so simple that the ordinary driver of vehicles will understand it from the beginning, otherwise elements of endless trouble are introduced, and before the driver realizes the necessity of taking it to a shop and having the same examined and fixed by one versed in mechanisms, the bearing is destroyed.

The United States Ball Bearing Co. claim that a three point bearing with straight slanting cones constitutes a construction at once

simple, practical and strictly in conformity with those general principles which must govern the correct construction of any anti-friction axle. In order to get the least possible friction on the bearing parts this company contends that the cones and ball cups (or races) must be so ground and formed as to produce bearing surfaces on angles of 45° . This company use nothing but the three point bearing and grind all their surfaces so that there is the least possible resistance to the ball in traveling over the same, and so as to provide for an equal distribution of weight thereon. The adjustment used by them is so constructed that by one mechanical device and by one mechanical movement the wheel is securely fastened upon the spindle, the bearings perfectly adjusted, and the device positively locked. The value of so simple positive adjustment in ball-bearings is indispensable. Everyone who has given any thorough study to this point, as well as those who have had practical experience in handling ball-bearing axles, knows that a ball or roller bearing adjustment without such an adjustment is indeed a very poor thing.

If the roller bearings and ball bearings were otherwise mechanically correct in their construction this defect alone would condemn them in the end.

Where there is neither a perfect bearing surface on the roller nor a perfect bearing surface on the spindle, the contact of these imperfect surfaces is bound to create much more friction than will accurately ground surfaces.

It is admitted that friction is a force, and in the construction of what is known as the "Collinge" and "half Collinge," the "long distance," the "roller" and "ball bearing" axles, the one object is to overcome, as far as it is possible, this force. If a man wants to do this he will never be satisfied with any axle which does not eliminate it as far as it is possible to do so, and any axle which does not do this cannot be called an anti-friction axle.

The advantages which an anti-friction axle has over what is known as the plain bearing axle are too well known and understood to justify lengthy consideration. The question which anyone has to ask of himself is not whether the ball bearing axle will reduce the friction, but whether it will carry the weight which horses and horseless vehicles are intended to carry. If this question is answered in the affirmative, then there remains no other question for the users of axles to consider, apart from the complex construction of what is known as anti-friction axles. If the anti-friction axle is as simple as it should be in its construction, then there can be nothing left to fret the mind of the user.

The anti-friction axle, properly constructed, reduces the friction to such an extent that it saves horses a great deal of labor; as the draught on the horse is reduced the necessities for consumption are reduced. The horse makes much better speed with less effort. A great deal of time and annoyance incident to frequent greasing and other attentions which the plain, ordinary axles impose upon those who use them are done away with. The tread of the wheels on an anti-friction axle, with a proper adjusting device, is absolutely preserved; they are thus prevented from wobbling, the life of the vehicle greatly preserved, and the riding comforts of same materially enhanced. These are only a few of the advantages which an anti-friction axle possesses over the plain axle. Inasmuch as the users of horseless vehicles will have to pay for every bit of power which may be required in operating such vehicles, the question of anti-friction axles is one of vital importance to the manufacturer of all kinds of such vehicles. The manufacturer who turns out a horseless vehicle, whether it be propelled by electric, gasoline, steam or other power, which runs easiest and consequently costs less to operate, has a talking point in favor of his vehicle which will not be overlooked on the part of the users of such vehicles.

BROWN'S ROLLER BEARINGS.

THIS pattern is manufactured by the Concord Axle Co., of Penacook, N. H. Simplicity is the leading feature, as will be seen by the illustration herewith, A, the axle arm, having a solid Collinge collar (shown in section), and which, with the axle, is of forged steel and hardened. B is the box to be fitted into the wheel hub. This box is of steel, and is hardened at the ends, which enclose the rolls. R shows the rolls, which are also made of steel and hardened. The rolls are held in place in the box by an annular groove at the inner ends, and by the retaining rings C, at the outer ends of the rolls, these retaining rings being formed with an annular groove on the

inner face, to hold outer ends of the rolls. There are just rolls enough to fill the annular space in the box, and the rolls are free to revolve in either direction. In use, the pressure of the axle on the rolls keeps the rolls straight or parallel with the center line of the axle. The retaining rings are made of steel, hardened, and are held fast to the ends of the box by the screws, as shown, and by steel pins inserted between the screws. N, the axle nut, of ordinary construction, which is screwed close up to the end of box, so

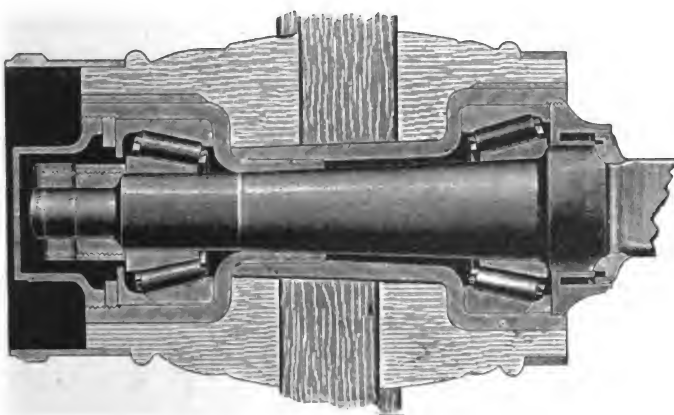


BROWN'S ROLLER BEARINGS.

that there shall be no end play. D, a brass cap, which is screwed on to the outer end of the box to keep the oil from coming out, as well as to keep the dust from getting in. At the other end of the box the Collinge collar covers the end of box, and as the collar is set into the hub of wheel no dust can get into that end of the box. This construction requires the least number of parts possible for a roller bearing, as (aside from the rolls) the two retaining rings are the only additional parts more than required for the ordinary form of wagon axles. This form of roller bearing axle is designed for use on heavy work only, and the simplicity of construction insures a reasonable price for the finished axles.

THE GRANT ROLLER BEARINGS.

In the construction of anti-friction bearings designers and inventors have as a rule met with disappointment: not from the want of a perfectly frictionless rolling surface, but from the destructive effect of every-day service. The part of the vehicle on which they are used receives the most severe treatment, being subject to all manner of strains, weights and jars, the effect of which has been, in a short time, to render them useless, or necessitate renewing the balls, or in the case of straight rolls, either to roll themselves or the end thrust mechanism. If the end thrust is taken by balls



GRANT ROLLER BEARINGS.

you simply have all the trouble inherent in the ball bearing. If by the ends of the rolls it causes great friction and twisting of the rolls themselves, as there are times when the entire weight of the vehicle is on the end thrust mechanism; this in conjunction with the unreliability of a screw thread adjustment, causes a great deal of trouble.

In the Grant bearing the rolls and the cones are on a taper, one set at each end of the hub with the small ends facing toward the center of the hub, so that the end thrust is taken by the face of the rolls. In fact the bearings will run as well in a vertical position. The rolls are put in cages, the spacing pins passing through a somewhat larger hole in the roll. The rolls are at such an angle as will insure their rolling perfectly true, or in a horizontal plane around the

spindle. There is no end thrust or tendency for the rolls to travel endwise whatever, owing to the angle of the cone race and rolls, therefore the Grant bearing presents the face of the rolls to all the strains subjected to the bearing, and as the rolls are long and large the surface is many times greater than with a ball bearing.

The cones are fitted loose on the spindle, so that the occasional slight turning presents the entire periphery to the wear, thus keeping it in a perfect circle. The adjusting is done with a double sleeve, one threaded over the other, and held in place by a linch-pin, making it impossible for the adjustment to change or work on or off. The watershed furnished with the Grant bearing is practically air tight and remains so, thus making the necessity for oiling and cleaning more a matter of convenience.

HYATT ROLLER BEARINGS.

THE adoption of the Hyatt Flexible Roller Bearings by many of the most prominent manufacturers throughout the country has gone far toward removing the stubborn prejudice which prevailed for many years against such a radical departure from the old style babbitted bearings. It is true that for the last century the question of roller bearings, as applied to line shafting, has been agitated. Numerous devices with the principle of rolling friction as a basis have been found impractical. Solid rollers have been used for many



HYATT ROLLER BEARINGS IN HANGER.

years, and are still used on heavy machinery; but when the reduction of friction on line shafting and loose pulleys was considered, it was found necessary to make a roller bearing which would yield in a measure to the conditions to which they might be subjected. John W. Hyatt, a noted inventor, made the first design of a flexible roller bearing, more than half a score of years ago. Since then the bearing has been constantly improved, until to-day it stands alone as the one flexible roller bearing which may be applied to line shafting with safety, and at a nominal expense. The Hyatt Roller Bearing Co., of Harrison, N. J., manufacture these bearings exclusively. The roller bearing hanger box, shown in Cut 1, is made to fit into any of the standard hanger frames which are now manufactured. The Hyatt Co. have their own hanger frame on the market, which is claimed to be one of the strongest patterns now in use. However, where it is desired to save power, but where the parties interested do not wish to throw away their entire hanger, the roller bearing boxes are made, by riveting different saddle castings on the bottom of the box, to fit the standard of all the transmission houses, such as Akron's, Brown's, Cresson's, Sellers', Prybil's, Dodge's, Lincoln's, Medart's, Poole & Hunt's, and many others. Thus, when new boxes only are purchased their cost is quickly realized by the saving in power, as this will run from 10 to 50 per cent. (according to the conditions and nature of the work) of that ordinarily consumed in friction. In hundreds of cases where trouble has been experienced by heating, the Hyatt bearings have brought relief. This is especially the case on loose pulleys, where the percentage of saving is very large. The second cut in this article shows a flexible roller bearing bushing, such as applied on machinery of all kinds. The rollers seen in this cut are wound cold on a mandrel into the spiral form, as shown. The thickness of the steel used, and the flexibility of the rollers, are proportioned in accordance with the speed and load under which they are to be operated. The bearings are constructed with due regard to these proportions, and will operate under any load or speed without heating. Referring to the speed, the American Specialty Co. have used rollers made by the Hyatt Co. on a machine running at 6,600 revolutions per minute, part of

the time fourteen hours a day. On account of their adaptability to high speed, they are being used almost universally on exhaust and ventilating fans. Boxes are constructed which are particularly suited to meet these conditions, and the Hyatt roller bearings are now considered by many users of fans as a necessity where a bearing is required that will run easily and not heat. The General Electric Co., of Harrison, N. J., have placed an order for their entire equipment of boxes and fan bearings with the company above named. The large new machine shop at Schenectady of the General Electric Co. is also equipped with about 300 2 15-16 in. hangers. The Elmira Knitting Mills, of Elmira Heights, N. Y., recently placed an order for several hundred hanger boxes after having tried the bearings in their old mill for several years. The Pope Manufacturing Co., of Hartford, Conn., are equipped throughout with Hyatt roller bearings on their line shaft. The Alpha Portland Cement Co., of Alpha, N. J., have a great number of six, seven and eight inch roller bearing pillow blocks on their line shaft. These bearings are particularly called to the attention of those who have reached the limit of power which may be delivered by their present plant. By replacing their babitted bearings with Hyatt flexible roller bearings on the line shafting a large percentage of additional power is made available. This means of increasing their power has been found much cheaper and more economical than the purchase of new engines and boilers. Many recent contracts for transmission machinery calling for Hyatt roller bearings have been placed; among others might be mentioned the Norwalk Iron Works Co., South Norwalk, Conn.; Bullard Machine Tool Co., Bridgeport, Conn.; Potter & Johnston Co., Pawtucket, R. I.; Yale & Towne Manufacturing Co., Stamford, Conn., and the Port Chester Bolt & Nut Co., Port Chester, N. Y. It may be stated that the flexible roller bearings have been found to be the most practical as applied to motor carriages. Competitive tests have shown that these bearings give universal satisfaction where tried for this purpose, and that a great many of the motor carriages



HYATT FLEXIBLE ROLLER BEARINGS.

of this country are now equipped with this style of roller bearing. Manufacturers and mechanical engineers who are experiencing trouble with their present bearings, or who are looking for something which will render more power available in their present plant, will find it to their interest to try these bearings. The Hyatt Flexible Roller Bearings are particularly applicable to friction clutch pulleys, pulverizing machines, harvesting machines, tumbling barrels, mowing machines, railroad hand cars, gas or gasoline engines, crushing machines, power blowers, saw machinery, printing presses, cloth calendars, sugar machinery, traveling cranes, pumping machinery, hoisting engines, beating engines, street-car trucks, testing machines, railroad turn-tables, band saws, shop trucks, grinders, elevators and buffing lathes.

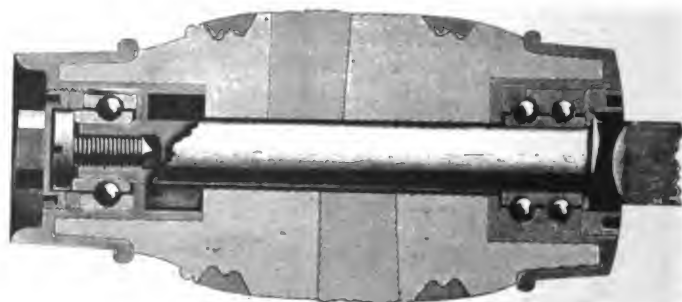
THE MEEKER BALL BEARINGS.

THE experimental stage in ball bearing axles is a matter of ancient history. The great impetus given to the manufacture of them by the more advanced and enterprising carriage and wagon builders, and also by automobile builders, has been unprecedented. They are now a staple article in the vehicle industry.

There are all kinds of bearings. There are roller bearings, ball bearings, cone bearings, lateral bearings. The Meeker differs from all others. It is none of the others. It is unique, and stands alone. It is a perpendicular bearing. It does not run on a flat cone and bear on a point, where the balls wear oval or crush with a sudden

jar. It runs in grooves the shape of the balls themselves, and they are protected. They cannot crush.

Lateral bearings require adjustment every time a wheel is taken off and put back on a vehicle. With the Meeker direct bearing there is no adjustment. All that is required is to screw the parts



MEEKER BALL BEARINGS.

up tight; the tighter the better, as they cannot bind the wheel. It is "always in order." It saves horse flesh. One horse will do the work of two. No hot box is possible; it is always ready for use. It can be used on all kinds of horse and motor vehicles.

The bearings seldom require oiling. Once in ninety days is often enough. Just enough to keep out dampness from the bearings, so there is no rust.

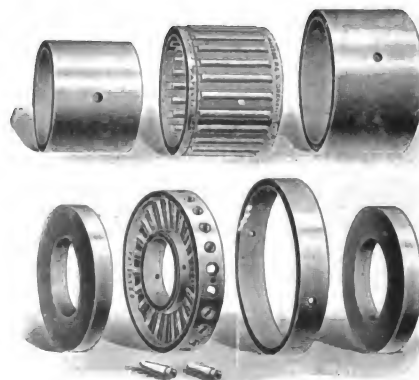
The special features of the Meeker ball bearing axles are strength, simplicity, durability and light draft. Friction on the spindle is reduced fully 50 per cent. The bearings are perpendicular, absolutely true, and directly in line with the spokes, making disarrangement impossible. With this direct bearing the end strain of the vehicle is overcome; the balls cannot crush. The various sizes will do all the work required of them, with either steel or rubber tires.

The demand for it by both carriage makers and automobile builders is the best guarantee of its success and of its merits.

It is in use in nearly every section of the United States, also in Canada, Europe and Australia, running on buggies and landaus, delivery wagons, coal wagons, gas and chemical engines. No washers required.

MOSSBERG ROLLER BEARINGS.

THIS bearing is manufactured by Mossberg & Granville, of Providence, R. I. It embodies a principle not shown in others, the bearings being adapted for shafting as well as for heavy vehicles. This roller bearing consists of a cage having its inside diameter slightly larger than the journal, and its outside diameter slightly smaller than the box or shell which comes in contact with the roll. The cage is bored with a series of longitudinal holes, which are carefully reamed to size, and in which are placed the steel rolls, as shown in the cut.

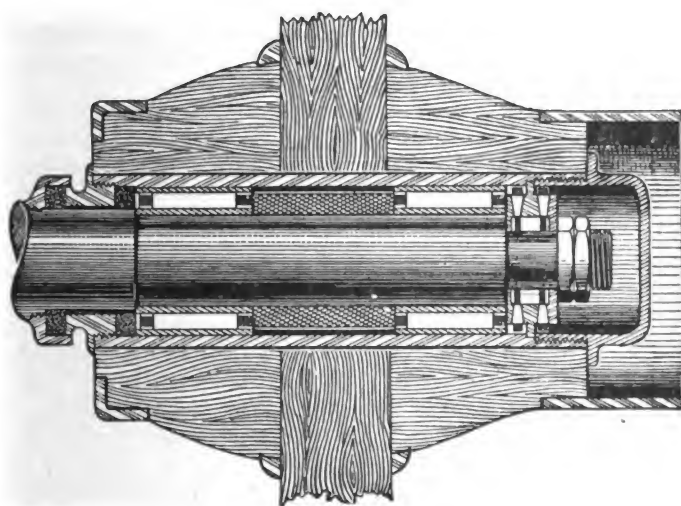


ROLLER CAGES AND END THRUST WASHERS.

These rolls are hardened and ground accurately to size. After the rolls are placed in position the cap is put in place and a groove cut, in which is inserted the wire which keeps the cap in place. The projections on the cap, which accurately fit between the bars of the cage, make the strongest cage that can be constructed, as it will stand nearly as high torsional test as if it were made in one piece. This roller bearing has been applied to journals of calender rolls under enormous pressure, and at a speed of 100 revolutions per minute. It has been in use almost continuously for one year, giving thorough satisfaction. These bearings are made in all sizes, from

$\frac{1}{2}$ to 24 in. diameter, and are applicable to all kinds of machinery, vehicles, etc., where it is proper to use an anti-friction bearing. A heavy wagon was fitted with these roller bearings, and a test made with one of the wheels shows the following results: With roller bearing: Weight of wheel, 237 $\frac{1}{4}$ lbs.; diameter of wheel, 29 3-32 in.; diameter of bearing, 3 in.; weight to start, 10-16 lb.; coefficient of friction, .00263. Without roller bearing: Weight of wheel, 234 $\frac{1}{4}$ lbs.; diameter of wheel, 29 3-32 in.; diameter of bearing, 3 in.; weight to start, 5 6-16 lbs.; coefficient of friction, .0229.

Their thrust bearing is made on the same general lines as their cylindrical roller bearing, and consists of a cage, the center of which is a running fit on the shaft, and contains conical rollers which come in contact with hardened and ground steel plates, the faces of which are ground to the same angle as the rolls. The angle of the rolls is so proportioned that under the heaviest pressure there is practically no end thrust of the rollers against the outer ring which keeps them equidistant from the center of the shaft. The thrust bearings will stand a very heavy load without danger of crushing the roll, as is frequently the case with ball bearings. Both



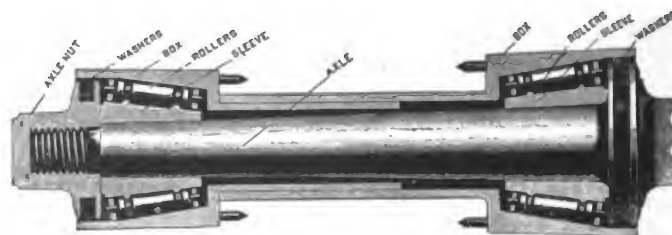
MOSSBERG ROLLER BEARINGS.

the roller and thrust bearings have been in constant use for the past seven years under all conditions of service, and they have given uniform satisfaction. The flattering increase in this line of business proves that the merits of the bearings are appreciated by the public.

TIMKEN ROLLER BEARINGS.

THE Timken roller bearing is manufactured by the Timken Roller Bearing Axle Co., of St. Louis, Mo., and, as will be seen, it differs distinctively from the others shown. This bearing is a conical constructed one. It is claimed to be the lightest possible running bearing, because its angles and rolling circles are constructed mathematically correct. The angles of rolls, cups and cones radiate from one point, termed the radial point, and are mathematically calculated from this point. See Fig. 1. The principle on which the end thrust is taken is mechanically perfect, viz., taking its thrust from the grooves in roll, against the rib or track at each end of roll and cone. It is claimed this feature alone reduces the friction over 20 per cent., as any roller bearing, whether straight or conical, takes its end thrust from one end of the roll, while the other end of roll is free to revolve, permitting it to advance beyond its relative rolling position, and it then becomes cramped and causes excessive friction and oftentimes breakage. When the end thrust takes place with the Timken roller bearing, which takes its end thrust from the rib on cone and groove in roll, it distributes the thrust or retarding motion equally at each end, which allows the roll to travel direct in its path and with each end parallel to its axis or its radial line, and causes little or no friction. With the conical roller bearing the end thrust is taken partially diametrically, as its line of axis is not parallel with the center line of spindle. Then, with the right angled leverage, which the wheel gives from its rim to point of contact, the leverage always favors the conical roll by taking its thrust diametrically. Again, the slightest wear in the conical bearing can be easily taken up. When the wear is not taken up it causes lost motion, which causes an increased leverage at outer periphery of rim to act again as an increased leverage to pound against rolls, cone and

cup, and it soon crystallizes the metal and breakage takes place. In the conical bearing this disaster is prevented, owing to the easy adjustment and the taking up of the wear. When conical bearings are constructed with the angles too steep it causes additional friction, due to end pressure. With this roller bearing the angles are not so

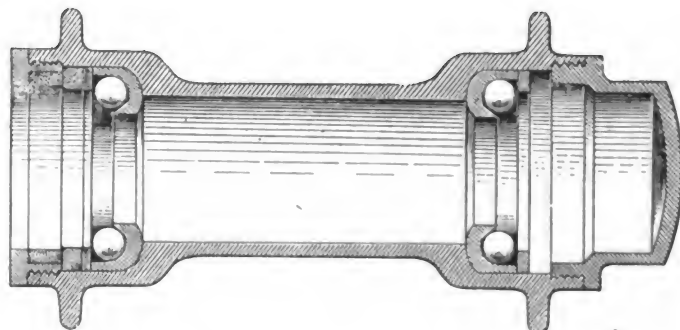


TIMKEN ROLLER BEARINGS.

steep that they cause any extra end friction, and are very small in diameter, allowing them to be put in any ordinary sized hub on the market, and it does not weaken the wheel at spoke space, which is the vital part of a wheel, because it does not necessitate cutting away the hub of wheel under the point of spokes, even as much as for the box of the common axle. This roller bearing is also constructed so as to give as much resistance against the spoke leverage as is possible, by putting the roll contact of box as near end of hub as is possible to do it, which adds greatly to the life of the bearings. Another feature is the simplicity of adjustment. When the adjustment is to be taken up the nut is removed from spindle and a very thin split steel washer is inserted in an indentation in nut provided for it, the nut replaced and the adjustment is taken up. The water and dust-proof device is claimed to be the simplest and most satisfactory of the kind yet introduced. A plain leather washer fits tight in the box and revolves with same, and fills groove in spindle and nut tight enough to prevent the water or dust from entering the bearing. These washers cause little additional friction and are easily replaced when worn out, and do not cause any additional friction when adjustment is taken up. No oil is necessary as a lubricant with this bearing, and the only reason that it is oiled is to prevent rust from forming on the parts. for without oil the metal attracts moisture, which produces rust and causes friction. Oiling once in six months is ample. In fact, oiling once a year has in many cases been found adequate with this bearing. The rolls are solid steel, and case hardened sufficiently to prevent wear, while at the same time they are not brittle and will not crush. These rolls are spaced apart and held in position by a cage which prevents any friction due to surface contact, which would be the case if they ran together. The material used in their construction is the best of steel, and case hardened to a depth sufficient to stand all severe strains without flattening or breaking.

THE WESTON-MOTT BALL BEARING HUB.

THE Weston-Mott ball bearing hub is designed specifically for wire wheels. As will be seen by the illustration it is extremely simple in its construction. It consists of a tubular metallic steel hub, with flanges for the wire spokes, ball pockets and retainers, cone adjuster, a dust cap over the front end and a dust collar at the rear,



WESTON-MOTT ROLLER BEARINGS.

together with leather and felt washers, making it absolutely dust proof and oil tight. The bearings are of equal dimensions at each end, and the balls are large. The position of the balls provides an end thrust as well as direct bearing. Three sizes are constructed, the largest being for automobiles and other heavy vehicles.

Dealers' Department.

THE BENEFITS OF DEALERS' ORGANIZATIONS.

THE recently organized Tri-State Vehicle and Implement Dealers' Association, which is intended to take in the dealers of Ohio, Indiana and Kentucky, concluded, after much discussion, to recognize as dealers those who carry as few as three vehicles continuously in stock. The eastern association, known as the National Carriage and Harness Retail Dealers' Association, fixes the minimum quantity at six vehicles. It is evident to anyone familiar with the differing conditions of trade in the various sections of the country that a fixed minimum quantity could not well be adopted which would suit everywhere. Six may be a just quantity throughout the East. The dealers themselves have so decided. Three may be a just number in Ohio, Indiana and Kentucky, and as the dealers have so elected it is probably right. But the definition of a dealer as one "carrying a stock of finished new vehicles commensurate with the demands of his community" is applicable anywhere, and his local association could determine on electing him to membership whether he was properly eligible or not.

The fact is that in every part of the country there are many who are well known to be regular dealers who run their stock down to the lowest possible point at the end of the season, and who aim to carry nothing over. Hence there will be times when they do not carry the required number of vehicles to come under their association's definition of a dealer.

However, it is said to be "a poor rule which won't work both ways," and this is probably intended more to use for the purpose of excluding undesirable members than as a rule to guide manufacturers in making sales. The manufacturer must use his own judgment in making sales.

Anyone traveling through the great West will see that every agricultural implement dealer is also a dealer in buggies. He may carry at times a carload; at other times six, or only three, or even none at all. A tour through the South shows that the vehicle dealer is a general store keeper, or a cotton buyer, or a trader in mules and horses, or a hardware man, or even a dry goods man, and occasionally he has a carriage repair shop; sometimes he deals in agricultural implements or harness. He is difficult to classify, and any rule requiring him to carry even one finished new vehicle always on hand would be sure to be broken by some.

There ought to be an association of implement and vehicle dealers for the States of Georgia, Alabama, Tennessee and the Carolinas. It would help to give symmetry and cohesion to the business, and bring the vehicle dealer into more prominence. It would enable him to act powerfully in conjunction with northern manufacturers or sister associations on the question of freight rates, and any other matters of mutual concern which might come up.

But the great advantage would be the establishing of a mutual basis of recognition between those manufacturers who are disposed to do business on the square with dealers, and those dealers who are willing to reciprocate those efforts, and use their endeavors to compel other dealers to do likewise.

It is time to define the legitimate and the illegitimate, not only among dealers, but also among manufacturers for the trade, and bring together the two essential factors in the business on a recognized basis all over the country.

For this reason we encourage the formation of dealers' associations. They are for the good of the trade in a large way, and we hope to see every section of the country organized, and then to have a general congress of representatives for the handling of questions of national importance in their business.

Rapid progress toward this end has been made, and will be made in the near future. The effect upon the general *morale* of the carriage trade cannot help but be good, and every carriage manufacturer will be bound to give the movement God speed, because it means a larger degree of business safety to him and the ability to maintain prices, for whatever benefits the dealer benefits also the manufacturer.

At present there is much hazard, much shifting among dealers and much uncertainty as to who are dealers, even under the best devised plans of local associations. Organization is the only possible way to bring order out of what is very like chaos, as the

business is conducted in some parts of the country. Time will be required, because the growth and development of the country must reach a certain point before the desired conditions are possible. But the methods of older communities will be more readily adopted in the new when those methods carry with them the power and advantages of organization, of recognition of stability and of credit. Let the unorganized districts of the West and South understand that organization means something that is equivalent to capital, reputation and credit, as well as protection from the cutting of prices by nondescripts; then they will also adopt those measures necessary for the purpose.

The spread of the idea of organization is due to the sound business ethics involved. It is not merely a moral ideal, nor yet selfish protection. It is far reaching and many sided in its effects. It makes power and possibilities which could not otherwise exist, and by creating order insures certainty in business transactions.

There are many natural and legitimate developments yet to be reached. It would seem idle to prophecy, because time changes conditions, but by means of organization can these changes best be met, and with the least damage.

The C. B. N. A. did a wise thing to acknowledge the benefits of organization by dealers and to show itself ready for suggestion from dealers through properly appointed committees, and for co-operation in mutual conference.

But we regret that the dealers have not met this advance in as practical a manner as was hoped. Organization seems to be so new among dealers that they have not yet waked up to their privileges. Some of them seem to think that their sole purpose is to cudgel the carriage maker or hold him in check with the threat of a club. This is not only a low view; it is not good business. The carriage maker is more alive to the benefits of organization than that. In it he sees the opportunity of dealing with dealers *en masse*. The ordinary dealer occupies a circumscribed field for his business operations, and knows practically little of conditions beyond. The manufacturer has the world for his field, and must perforce know the conditions which affect him everywhere. Yet the details of each locality are best known to the dealer, and when by presenting them in classified form to the manufacturer, who is enabled to co-operate through his association, these conditions are ameliorated, rendered more safe and profitable, then both parties partake of the benefits.

It is not necessary that dealers' associations assume any spirit of antagonism to manufacturers. They may rest assured of the latter's hearty co-operation in any business proposition which has for its object the betterment of trade conditions.

HOW ORGANIZATIONS MIGHT PROVE DETRIMENTAL.

THE *Implement Trade Journal* says: Self-preservation is said to be the first law of nature, and the man who will not fight for his rights is considered a coward, but when he ruthlessly tramples under toot the rights of others because his position enables him to do so, he is termed a bully. The acquisition of power by individuals or organizations brings with it the temptation to use the power thus acquired for unholy purposes. Striking illustrations of this are found in the tactics frequently employed by labor unions, where great loss and damage are caused to employers for the purpose of gaining a point. The point may be gained for the time being, but it will eventually work to the detriment of those who for the moment seem to be the victors. Labor organizations should be the means of promoting friendly relations between labor and capital, of bringing employer and employee in closer touch with each other, and of raising the standard of the laboring man. But the contrary is the result; the breach is being widened, and there is a feeling of hostility between the two that is being openly manifested in too many instances.

That the organizations of retail implement, vehicle and hardware dealers that have been brought about in recent years have been beneficial to the trade is generally conceded. That they may be made to prove of inestimable value in the future, if properly conducted, no one can doubt. There is but one danger that they may fail of their purpose, and that is by a wrong use of the power a strong organization is able to wield. If the management and control of the organizations are kept in the hands of fair-minded and conservative men, who can hold in check those who would pass radical and extreme measures, the organizations will grow and prosper. If, on the other hand, the organizations yield to the temptation to use their

power to force concessions that are unreasonable from manufacturers and jobbers because they can do so, the harmony and good feeling that has hitherto existed between dealer and jobber will be a thing of the past. The radical and the extremist says: "But they've got to come to our terms; we are a strong organization and we'll stand together. We can drive any house out of business if we make up our minds to do so." But the dealers do not have the advantage. If they should become too exacting and withdraw their trade, there is still left for the jobber or manufacturer the catalogue house method, and he can sell direct to the consumer.

It is to be hoped, however, that reason and good judgment will dominate the leaders in all of these organizations, and that the time may never come when dealer, jobber and manufacturer may not mingle with each other in a spirit of fraternity and with a feeling that each is interested in the success of the other, and that concessions are made on both sides, not because they have to be, but because each is prompted only by a desire to do what is right.

THE AMERICAN VEHICLE WOODSTOCK ASSOCIATION.

THE American Vehicle Woodstock Association, originally formed some years ago, met on February 14, 1900, at the Grand Hotel, Cincinnati, for the purpose of reorganization, and had the largest representation in its history. The association is composed of the leading manufacturers of bent wagon and buggy rims, shafts, poles, hickory and oak spokes, hubs and all classes of miscellaneous woodstock for vehicles.

In view of the general advance in the price of lumber and all classes of rough stock it became necessary for the manufacturers to meet to discuss trade conditions and the effect the advanced price of raw materials would have on the finished products. They decided upon a proportionate advance in prices and adopted uniform price lists to take effect at once.

The following companies, representing about 75 per cent. of the entire output of this class of material, were present:

J. H. Stephan & Son, Hamilton, O.
S. E. Smith, Monroeville, O.
The Pioneer Bending Co., Piqua, O.
F. F. Kohler, South Zanesville, O.
St. Mary's Spoke Works, St. Mary's, O.
Tiffin Bent Wood & Lumber Co., Tiffin, O.
Lamson & Skinner Bending Co., Toledo, O.
The Toledo Bending Co., Toledo, O.
The Troy Bending Co., Troy, O.
Wellington Bending Works, Wellington, O.
H. J. Kimble, Zanesville, O.
The Wildermuth Bending Co., Columbus, O.
L. Deinzer & Son, Hamilton, O.
James N. Anderson, Sidney, O.
The Chatfield Bending Co., Chatfield, O.
Ohio Wheel Co., Delphos, O.
The Cunningham Manufacturing Co., Fostoria, O.
G. F. Haury Bending Works, Erhardt, O.
Barberton Bending Co., Barberton, O.
C. H. Neil & Co., Columbus, O.
Valley Manufacturing Co., Chillicothe, O.
Seymour Manufacturing Co., Seymour, Ind.
Brownstown Manufacturing Co., Brownstown, Ind.
C. E. Briant Bending Works, Huntington, Ind.
Cone & Jones, North Vernon, Ind.
J. R. Hussey & Co., Indianapolis, Ind.
Von Behren Manufacturing Co., Evansville, Ind.
J. H. Smith Co., Muncie, Ind.
The Weis & Lesh Manufacturing Co., Muncie, Ind.
The Lack Singletree Co., Paducah, Ky.
Purchase Wheel Stock Co., Paducah, Ky.
J. W. Little, Paducah, Ky.
Von Behren-Russell Co., Louisville, Ky.
Louisville Spoke & Bending Co., Louisville, Ky.
Dresden Spoke Co., Dresden, Tenn.
The Weis & Lesh Manufacturing Co., Jackson, Tenn.
Gallatin Spoke Works, Gallatin, Tenn.
Harriman Hub & Spoke Co., Harriman, Tenn.
Ward & Brassfield, Greenfield, Tenn.
Enterprise Spoke Co., Gerley, Ala.
Hagerstown Spoke & Bending Co., Hagerstown, Md.
Virginia & North Carolina Wheel Co., Richmond, Va.
Forest Hardwood Manufacturing Co., Little Rock, Ark.
Himmelberger Luce L. & L. Co., Morthouse, Mo.

The following officers were elected to serve for one year:

B. F. Von Behren, president, Evansville, Ind.
J. M. Skinner, vice-president, Toledo, O.
E. O. Buchanan, second vice-president, Gallatin, Tenn.
J. H. Smith, third vice-president, Muncie, Ind.
J. E. Buscher, secretary and treasurer, Louisville, Ky.
J. C. Clark, assistant secretary, Toledo, O.

Committees were appointed on Supply and Demand, Classification, Prices and Discounts, Transportation, Membership and Grievances.

It is the intention of the association to meet about every sixty days, and they expect to interest every manufacturer and get them all to join the association.

Streets and Roads—Their Construction and Maintenance.

RECENT HIGHWAY WORK IN MARYLAND.*

THE Maryland Geological Survey, through its highway investigations and its recently issued report on Highway Improvement in that State, has rendered the cause of good roads in the country at large an important service; and it is hoped that both its work and this report may serve as a model for many other States, and may develop into a definite modern highway system.

The General Assembly of Maryland, in an act passed early in April, 1898, provided an appropriation of \$10,000 per annum for the investigation of questions of road construction in the State and for the preparation of reports thereon. Under this act a highway division was at once established under the supervision of the State Geologist, Prof. W. B. Clark, and Dr. H. F. Reid was appointed chief of the division; Mr. A. H. Johnson was appointed highway expert, to examine in detail the present condition of the highways and to suggest the best methods for their improvement; Mr. St. George Lioussat was appointed special assistant to examine and discuss the road legislation of the State and the several counties, and Mr. F. H. Schloer was appointed as machinist to aid in the work of testing the materials found in different portions of the State, as to their suitability for future highway construction. It was also arranged that other assistants connected with the different branches of the survey should co-operate in examining the character and distribution in the State of these road building materials. In this way a large amount of valuable data has been brought together in a short time.

Of a volume so full of information, and so excellent in its design and execution, it is difficult to give anything like an adequate description within a reasonably short space, but all highway engineers in this country should secure a copy for themselves. In a short introductory chapter by Prof. Clark is given a brief statement as to the character and extent of the investigations carried on during 1898 and 1899. This is followed by a more elaborate chapter by the same author on the relations of the general surface features of the State, and its climate (especially rainfall, frosts and winds) and geology to modern road building, a subject which must be thoroughly understood by the highway engineer before he can intelligently plan, locate or construct either a system of highways or an individual road.

The relation of the distribution and character of Maryland's rock formations to highway construction is discussed in still greater detail in this same chapter, first as relates to the road bed or foundation, and then as to the character and distribution in the State of road materials. In Eastern Maryland we find mainly sand, clays, and loams, together with limited deposits of gravels and still more limited supplies of shell-limestone—none of which is suitable for first-class roads. Mr. Johnson states (p. 203) that some 250 miles of oyster-shell roads have been constructed about the head and on the eastern shore of the bay, at a cost ranging from \$1,000 to \$2,000 per mile. In many portions of Eastern Maryland, and indeed over a large portion of the entire coastal plain region of the United States, for improvement of the roads in the deep sandy regions we will have to depend upon the proper admixture of clay and the use of wide tires on draught vehicles to prevent the cutting to pieces of these sand-clay roads during either wet or very dry weather.

*Report on the Highways of Maryland: Maryland Geological Survey, Vol. III., 1899, 461 pp.; W. B. Clark, State Geologist, Baltimore, Md. About 8,000 copies were printed.

In Central and Western Maryland the question of satisfactory materials for road building is much more easily solved, as suitable materials—such as trap rock (diabase and gabbro), granite and limestone—are much more abundant and more widely distributed. The character and distribution of these materials are shown in detail on an excellent colored map of the State and the colored maps of each county, which accompany this report.

In Part IV. of this report Dr. H. F. Reid describes the qualities of good road metals and the methods of testing them. Under the "Methods of Testing Road Material" Mr. Reid describes briefly (1) The microscopic examination as showing the structure of the rock; (2) abrasion test, which has been so long practiced in France and other countries; (3) the crushing test, which shows the resistance of the rock to crushing action or blows; (4) the cementation test. Of these the abrasion and cementation tests are undoubtedly the most important. For many years the French highway engineers depended almost entirely upon the abrasion test, but one of the important results arrived at through the investigations of the highway laboratory of the Lawrence Scientific School, under Prof. Shaler's direction, is the demonstration of the fact that the cementing property of the road metal, as the surface is ground under the wheels and hoofs, is as important and perhaps more important, in many cases, than its power of resisting wear.

Part IV., on the present condition of highways in Maryland, by Mr. A. N. Johnson, is one of much interest to the student of this great problem of highway improvement in America. The total number of miles of public roads given in Maryland is 14,483, or 1.47 miles of road for each square mile of area. Of this there are 890 miles of stone road, 225 miles of gravel road, 250 miles of shell road and 13,118 miles of typical American earth road. The Maryland Geological Survey has now a well equipped testing laboratory, and will carefully test free of charge for citizens of the State all materials that are to be used in highway construction. In no way can it render a more valuable service. Unfortunately most of these improved roads were constructed without competent engineering supervision and without proper care as to the grades, and the folly of such practice cannot be stated too emphatically nor too often. Perhaps the first urgent need of the typical American highway today is that it be properly relocated by a competent engineer before there is any extensive improvement of the surface. Following this (or preceeding it) the roads should be carefully classified into those of greater or less importance, and then a definite plan of improvement should be adopted, the State co-operating in and supervising the work.

Mr. Johnson also brings out the fact that the average length of the haul for farm products in Maryland, including the distance from farms to the markets and railway stations, is for the State 6.7 miles, ranging in different counties from four to twelve miles. And he estimates the average cost of hauling one ton one mile in Maryland at 26 cents, as compared with an average of 25 cents for the United States, and from 7 to 12 cents in England, France and Germany, and from 7 to 16 cents per ton per mile in New Jersey. In a succeeding chapter, which must prove of great value to the people of Maryland, Mr. Johnson discusses the methods of constructing and repairing public roads.

The question of road administration in Maryland and in other States and countries is discussed by Dr. H. F. Reid, and a large amount of information concerning this subject in practically every State of the Union has been brought together in so careful a manner as to make it of permanent value to the country at large. And one is amazed to see that in so few of the States have any practical methods been adopted looking to the permanent betterment of our highways. In this great work New Jersey and Massachusetts have taken the lead in building important highways under State supervision, and in part at the State's expense. New York is slowly following in their footsteps. But as we run over the list of other States one is struck with either the indifference manifested in the majority of these States, except in isolated localities, or else the aimless sort of way in which some spasmodic local efforts are being made toward the improvement of the public highways over which our rural population must travel and must market its products at a cost approximating \$600,000,000 per annum greater than this cost would be if these more important highways were in good condition.

Many facts demonstrating the "Advantages of Good Roads" are brought out by Dr. Reid in a succeeding chapter, and in Part III., on the "Highway Legislation" in Maryland and its influence on the economic development of the State, Mr. St. George Lioussat has brought together in an interesting way a large amount of informa-

tion relative to highway legislation and the early history of Maryland.

The general make-up of this volume is all that could be desired. The illustrations are numerous and excellent in quality, there being thirty-five excellent half-tone plates and maps illustrative of the various topics treated in the report. The maps, which are exceptionally clear, show the distribution of rainfall, temperature, road materials and the main roads of the State, in a clear and attractive manner.

Chapel Hill, N. C.

J. A. HOLMES.

THE VEHICLES OF HAVANA.

HAVANA and the country immediately surrounding it can boast of a greater variety of vehicles and means of conveyance than any other country on the face of the globe. This statement may seem extravagant at first glance, but it is in no sense an exaggeration. In no particular is the island of Cuba more primitive than in its means of transportation. Yet in Havana there is so much wealth that the carriage markets of Paris, London and the United States have been searched for the finest broughams and landaus. Havana is said to possess more wealth than any city of equal size in the world, though she also can show more poverty among her masses than most metropoli. Extremes have met here in peoples; likewise extremes have met in equipages. The rich have the finest, while the humbler citizens, the honest yeomen and the teamsters of the wholesale districts have the crudest wagons and carts to be seen on the western hemisphere.

The incomer's introduction to the vehicles of Havana is just outside of the landing stage of the custom house. Outside of the great portals guarding "la machina," or the wharf, there is a cab stand in a triangular plaza of diminutive dimensions, from which the tourist selects his vehicle for his ride to the hotel. The vehicles found here for hire are usually of the meanest class of public cabs, drawn by the poorest-fed ponies in the service, by harness about as dilapidated as any in the cab force of the city. Just why the shabbiest cabs congregate at the wharf is not known. But there is hardly ever one of the better class at this point. These vehicles are small, victoria-like cabs; the front wheels are low, the driver perched upon a seat above those occupied by passengers, the victoria top overhanging the rear seat until cabby is almost hidden from view. This seems like an unnecessarily cumbersome top, making ingress and egress ungraceful and difficult; but when it rains or when the sun is shining with full southern vigor it is noted that it is a convenient, even if an ungainly, cover. These little vehicles are narrow, to suit the streets; are hung on platform springs, that turning may be done in the narrow thoroughfares with readiness, and their undergearing is substantial to the last degree. They are heavy, though small.

The public cab system of Havana is one of its features. Fares are low—a peseta for a ride for one or two passengers within certain prescribed limits, whose area is large, a peseta being 20 cents in Spanish money or about 14 cents in American coin, there being nothing to complain of in this particular; so that even if the wharf cabs are old and the ponies scrawny and the harness dilapidated, passengers get to their hotels with reasonable speed for a very limited fare. Five cents more is charged for each additional passenger.

In the better streets and around the parks are stands at which are to be had excellent cabs drawn by strong little horses, some of the turnouts being worthy of cordial commendation. They are of the same style as the wharf cab, but are newer, of far better finish, and evidently owned by the consolidated cab company instead of by a poverty-stricken cabby. The style of vehicle and stockiness of horse are particularly suited to the streets and cobbles of Havana.

In driving from the wharf to the hotels "Old Havana" has to be traversed. In the wholesale district the vehicles are ungainly and cumbersome. They are quite as inappropriate to the conditions of the city as the little nags are appropriate. All freight-carrying is done by mule carts of enormous size. The wheels are five, six and seven feet high, with enormous projecting hubs, which add to the width of the carts, some of which are so wide as to more than half block the street. Their high wheels necessarily make the beds and trucks far from the ground, and it has been noticed that the heavier and more difficult to handle the freight happens to be, the higher and bigger the cart. New Orleans has drays for the handling of sugar, molasses and other like merchandise; but Havana has carts

(Continued on page 42.)

Automobile Department.

ABOUT AUTOMOBILES AND MOTORS FOR THEM.

Editor of THE HUB:

We will not consider electric vehicles, if you please, but confine ourselves to the type that is driven by air, steam and other driving fluids which give the most satisfactory results, generally speaking, under all conditions, especially in regard to weight, cost and room in the body for passengers or packages. A motor of six or seven horse power will suffice for a four passenger carriage, under ordinary conditions as to hills, etc.

Vehicles commanding the best price have no coupling pole, and the fore carriage turns under the body. This type of vehicle, both in numbers as well as quality and price, makes the best investment for town and city trade. It seems, therefore, that the motor and its outfit, attached only to its fore carriage, and its levers convenient to the driver, should have precedence over other styles of automobiles. The manufacturer who adopts the present styles just as they are now made, as automobiles, changing only the fore carriage, should surely win. These vehicles are the result of long years of practical experience in catering to the exacting wants of the vehicle public. It is not good sense to lose all this, and build the automobiles outside of these correct lines of vehicle construction.

I contend that the turnunder carriage will make preferably the best automobile. Besides, it is an easy matter to convert those on hand into automobiles in this manner. Again, all present carriage and vehicle makers would be "right in it," and would only have to buy the equipment for their fore carriage. Another fact "patent to all," Messrs. HUB, is, if a customer had two or three different styles of vehicles (painted alike) he could hitch his team (the fore carriage) to either of them at will. We are speaking of the landau, the brougham, the victoria, and many styles too numerous to mention that turn short, and have a fore carriage and driver's seat over the fore carriage; such are easily and readily made or converted into automobiles. It is not necessary to remark that many people would immediately desire such automobiles from manufacturers at the present time, and that this would vacate hundreds of stalls inside of city limits and abolish the resultant filth exposed on the city streets, which is a great matter of health, and economy as well, to entire cities. May the time come soon when horses shall be excluded from certain crowded business portions of the city. The business men of New York should not be sandwiched in with horses and breathe the same air.

Having selected the proper vehicles for automobiles, and considered the extent of the field whose roads, streets and pavements are to-day ready for these vehicles, and having located the motor and its outfit on the fore carriage, the next thing to consider is the ideal motor. What should it be? It should occupy but little room, be of light weight, strong and compact, dust proof, exceedingly simple, and easily run and cared for by any ordinary person. Moreover, it should not be expensive, and any broken part should be duplicated and furnished at nominal cost. It should be thoroughly lubricated automatically. The motor could use steam or other driving fluids, liquid or compressed air.

It certainly should be a rotary motor, giving its own rotary motion to the vehicle wheels with direct and position action, avoiding the necessity of having dusty and gritty chains, belts, cogs, or gears. The motor should be hermetically sealed against dust and grit, and should be keyed directly to the center of a revolving axle. The original axle, minus the spindles, should be arched and made to support the springs and body, as before.

A rotary motor 12 inches in diameter and 6 inches face would do, if steam is used. The steam should be superheated; neither the boiler or motor should show any escape of any moment. By utilizing its exhaust, little water need be carried, and oil and water are always accessible. This same motor could be made to utilize liquid or compressed air when it becomes a commercial article. The motor, moreover, should be practically noiseless and run even and smooth, and free from jar and jostle. The necessary outfit could be located at opposite sides of the motor, and present no unseemly appearance. Such a motor in successful use, on the line of vehicles indicated, would give us the desired styles of automobiles quickly (with no unnecessary and expensive experimenting on the vehicles themselves) and horseless carriages which the entire world

would confirm as models of taste, style, beauty, efficiency, durability and luxurious elegance. May this motor soon make its appearance, and automobile builders abound. The writer's attention has been called to an outfit that seems to possess these features to an exceptional extent.

Yours truly,

CHARLES COMSTOCK.

Norwalk, Conn., March 21, 1900.

A NEW AUTOMOBILE CLUB.

THE organization of an automobile club at the Cliff House, San Francisco, Cal., on March 2, is an indication of the hold this new vehicle has made upon the public and the importance it is about to assume. The meeting was attended by a number of prominent business men, both of San Francisco and Oakland, who are either owners of automobiles or interested directly or indirectly in the manufacture of them. Among the members of this new club are Sol. D. Rogers, formerly of this city, who was elected temporary president; Hiram T. Bradley, the well known electrical engineer; James K. Cambridge, of Alameda; Professor J. B. McChesney, of the Oakland High School; Herman Oelrichs, S. Goodenough, and a number of others. The object of the new club is an organization for the advancement of the interests of those connected with this new sport, the members appreciating the fact that until the public becomes accustomed to the use of automobiles it will be, to a certain extent, prejudiced against them, and that in case of the necessity of litigation, by a strong organization they will be able to accomplish more and place their favorite sport upon a sound footing sooner than by any individual effort. One of the features of the club will be the issuance of membership cards to the members as soon as a permanent organization is effected. These cards will state that the bearer is a member in good standing and entitled to all the privileges of the club and will also contain directions and instructions regarding certain restrictions in the use of this form of carriage, rate of speed allowed for it and such other information as may be necessary. One of the rules of the club will be that if any member violates any of those restrictions his membership card shall immediately be taken from him. It is thought in this way, showing the public generally, and the park commissioners particularly, that it is not the desire of the automobilists to force themselves into immediate recognition, but rather to bring about a gradual recognition of their rights by education, that they will forestall much of the promised opposition. The members show a disposition to conserve their privileges and be thankful for concessions obtained. No speeding will be permitted and no liberties will be taken with existing road regulations. As fast as the membership of the club and finances warrant touring stations will be established by the club at various points about the bay. At the club yesterday temporary officers and working committees were selected and a permanent organization will be perfected as soon as a suitable plan can be adopted.

NEW "AUTO." CLIMBS FORT LEE HILL.

MR. WHITNEY LYON, one of the governors of the Automobile Club, is enthusiastic over the result of his test of a new electric "auto." In this vehicle, with only a single charge of the battery, Mr. Lyon was able to travel more than thirty-eight miles, and what pleased him all the more was the fact that the machine climbed the steep Fort Lee hill.

The "auto" weighs 2,000 pounds. It is of two and a half horse power, and has a storage battery of forty cells. Mr. Lyon started from the Waldorf-Astoria and proceeded to the Fort Lee ferry. After crossing the ferry the machine had before it a test under which all other electrically propelled vehicles had failed. But this "auto," to the astonishment of Mr. Lyon, took to the hill as if it were just what it was looking for. One or two steam power machines have been able to climb the hill, Mr. Lyon told me, but they were badly damaged in the effort.

Mr. Lyon and his companion continued north to Palisades avenue, turning west into Englewood. After running around Englewood for a while the return trip was made to West Sixty-sixth street, this city. The number of miles covered was more than thirty-eight, and there was still enough current left for a trip to the Battery.—*New York Herald*.

The machine above referred to was a "Cleveland," built by the Cleveland Machine Screw Co., of Cleveland, O.

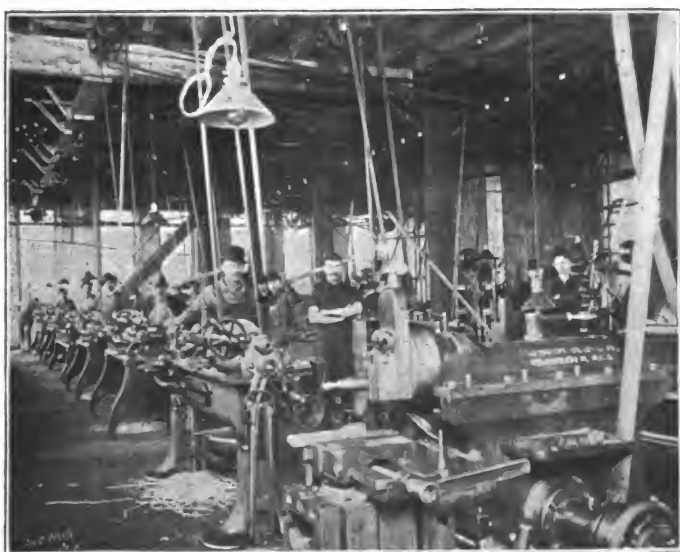
THE AMERICAN ELECTRIC VEHICLE CO.'S PLANT.

THE recently fitted up factory of the American Electric Vehicle Co., at Hoboken, N. J., is one of the most complete plants of the kind in the country. It is a large four-story brick building, located on the corner of Third and Clinton streets, having a floor space of 60,000 square feet, to which has been added a one-story frame extension 50 x 70 feet. The rear portion of the extension, 50 x 40 feet, is used as a blacksmith shop. In this is a large steam forge for heavy work, and smaller forges for general purposes. The remaining portion of the extension, 50 x 30 feet, is used as a shipping and charging room. The machinery room is on the ground floor of the main building. This is fitted up with lathes and other machinery of the latest improved types, for turning axles, hubs and gear cutting. As is shown by the illustration, this is a busy room.

The second floor is fitted up with a light line of special light machinery, a tool room, where all the tools are made, presses for making armature discs, etc., a battery department, where eight complete sets of batteries are made in one day, a fire proof room for stock, everything being arranged to insure speed and accuracy in handling. The third floor is used by woodworkers and wood-working machinery, and for assembling. The stock room is also located on this floor. The fourth floor is occupied by painters and trimmers. The whole factory force is about 200 skilled workmen.

On the ground floor, on the Clinton street front, is located a set of neatly and conveniently fitted offices, and the engineers' room.

Throughout the entire plant everything is systematically arranged, and every facility applied for prompt and efficient work. We believe this company is the only one, so far as we know, that has under its own control all the elements for manufacturing each and every part of the motor vehicle. They pay no tribute to anyone. Their work is done in the most thorough manner, by skilled men, and their styles are both artistic and practicable. Their New York City headquarters evidence the same care and attention to details as shown in the factory. These are located at 134 West Thirty-eighth street, where purchasers can inspect the various types of automobiles built by the company, and after the automobile has been sold, where the facilities for charging are ample. A more central spot in New York could not be selected. The Metropolitan Opera House and all the leading theatres are within stone's throw, and all the fashionable life of upper Broadway passes along within half a block of the station. Upstairs are the offices of the company, and handsome waiting and retiring rooms for patrons, with files of all the literature of auto-mobilism. Above the building is a tall sign which gleams nightly with hundreds of incandescent lamps advertising the American Electric Vehicle Co. The lower floor of the station is devoted to charging, current being taken in at a board and meters in the front. The rear



MACHINERY ROOM, SHOWING HEAVY MACHINERY.

portion of the floor, which runs well through the block, is devoted to cleaning up vehicles on the return. Charging plugs are provided, so that as many as thirty vehicles can be taken care of at one time. The decorations of this department are illustrative of the contrast between the "horseless age" and that which preceded it. Current is on night and day from the Edison street mains, and there is a night

bell by which patrons can summon the attendants, who are always present.

The company is beginning to mass at this new station a number



REAR VIEW OF FACTORY, SHOWING MAIN BUILDING, REAR EXTENSION, ENGINE ROOM AND NEW ELEVATOR SHAFT.

of types of its new automobiles, and visitors have an opportunity to examine the latest type of high class motor carriages.

ANOTHER ELECTRIC VEHICLE COMPANY.

THE Buffalo Electric Vehicle Co. was organized March 1 under the laws of the State of New York, for the purpose of manufacturing electric vehicles in that city. Work will be started in the Burgess Arms Co.'s factory, in Military Road, near the Belt Line tracks.

The list of incorporators follows: F. A. Babcock, Buffalo, once a large carriage manufacturer at Amesbury, Mass.; Isadore Michael, Buffalo, capitalist; Edward Michael, Buffalo, capitalist; Cassius M. Carrier, Buffalo; Henry C. Diehl, manager *Interstate Dispatch*, Buffalo; E. C. Randall, Buffalo, attorney; Theodore S. Fassett, lumber, Buffalo; former Mayor Jacob G. Amos, Syracuse, miller; Charles M. Warner, Syracuse, president malting trust; Leonard B. Crocker, Buffalo, capitalist; F. B. Robins, Buffalo, real estate. F. A. Babcock is to be the general manager of the new concern. His experience in the carriage manufacturing line, some few years ago, especially fits him for a position of this kind.

NEW MOTOR VEHICLE CORPORATIONS.

THE CONRAD MOTOR CARRIAGE Co., of Buffalo, N. Y.; capital, \$25,000; directors, Julius H. Potter, Frank P. Conrad and David W. Adams, of Buffalo.

THE DURYEA POWER Co., of Reading, Pa., will apply to Governor Stone for a charter on April 28. Herbert M. Sternbergh, Charles E. Duryea, Henry Milholland, Adam L. Otterbein and Cameron E. Strauss are the incorporators. Mr. Duryea is an inventor of considerable note, who recently located in that city, and among other things the new company will manufacture a gasoline automobile. A portion of the Reading cycle plant, Tenth and Exeter streets, has been rented for a factory.

DECISION AFFECTING AUTOMOBILES.

THE Treasury Department, Washington, D. C., has decided that an automobile cannot be admitted from a foreign country free of tariff duty as a personal effect under the terms of the tariff law. The decision was rendered in reply to an inquiry from J. R. Roosevelt, of New York, through the collector of customs at that port. Mr. Roosevelt declared his intention of going to Europe for a few months, taking his automobile with him, and asked if it could be brought back with him free of duty.

THE WOODS MOTOR VEHICLE CO.

ONE of the largest plants in this country engaged in the manufacture of automobiles is the Woods Motor Vehicle Co., of Chicago, Ill. Some conception of the magnitude of the plant may be gathered by the following brief description: The building is located at 547 to 551 Wabash avenue, is five stories high, 70 feet wide and 547 feet deep. The main offices and repository are located on the main floor. The office force consists of sixteen persons. The private office of Mr. Woods is on the second floor. The paint shop is also located on the second floor, where forty-four painters and varnishers are employed. The trimming and hanging up is done on the third floor. The woodworkers occupy the fourth floor, while the fifth is given up entirely to the blacksmiths. In each and every department there are ample appliances, and such modern machinery as is necessary to facilitate the work and to produce the best results. The battery department is located in the basement. In addition to the main building there is a second five story building, 50 by 150 feet, located on Twentieth street, near Wabash avenue. The total force employed by the company is about 400, which will be increased as soon as they can get their new plant, on Seventh avenue, near Twenty-third street, New York City, completed.

On February 23 this company shipped twenty-one surreys, one break and five road wagons to the Hawaiian Automobile Co., of Honolulu. The shipment across to the Pacific Coast was made over the A. T. & S. F. R. R., seven cars being required, the batteries alone filling one car and about one-half of another. This is by far the largest single shipment ever made by any one automobile company. The value of the shipment was about \$60,000. It was accompanied by one expert, who will probably remain in Honolulu to look after the interests of the company. Within a few weeks past they have shipped nine carloads of their finished automobiles to New York City. In addition to their regular work they are building ten wagons for the American Tobacco Co., of special models. This, however, is but a trial order; others are to follow. They are also building three omnibuses, for the New Haven (Conn.) Cab Co., to carry fourteen persons. It will thus be seen that the company is in the field for business, and are now prepared to meet the demands that will be made upon them.

WALTHAM MANUFACTURING CO.

THE most important piece of news in the automobile trade during the past week is the announcement that the Waltham Manufacturing Co. have secured the exclusive American agency for the Aster motor, made by the Aster Motor Co., of Paris, France, and in future they will fit their tandems, tricycles and quadricycles with either the

used in paced races throughout the country. Last winter they brought out and are now delivering tricycles and quadricycles. It has been generally conceded that their motor tandem is much more graceful in appearance than any that have been produced on the other side, and as will be seen from the accompanying cut, the Orient quadricycle certainly presents a more elegant appearance than the pictures which we are accustomed to see of the French machine. As will be seen from the accompanying cut, while similar in most respects to the De Dion, the Aster presents a somewhat different appearance. The De Dion motor is cooled by flanges cast into the cylinder, while the Aster is cooled by corrugated copper flanges compressed around the cylinder head. The Aster Co have a patent on their cooling device, and claim that it is superior to the other in that copper is a better conductor of heat, hence a better radiator than iron, and that on account of the corrugations the flanges have a great deal more cooling surface. The De Dion and Aster motors are the two best known and most widely used motors of this type in the world, and with its reputation for high grade goods, together with ability to supply either of the above motors, the Waltham Manufacturing Co. should have a brilliant future in the motor cycle field. The Waltham Manufacturing Co. have christened their quadricycle "Autogo."

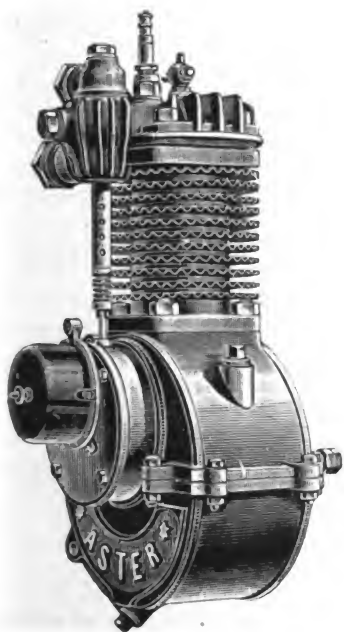
AUTOMOBILES IN SWEDEN.

If the American manufacturer of automobiles looks sharp he may have a chance to earn an honest penny in Sweden by selling his surplus stock.

It turns out that the cabbies of Stockholm and Copenhagen recently met together in solemn conclave to consider the advisability of purchasing motor carriages. They consulted sundry catalogues from the factories of Berlin, profusely illustrated with automobiles of all sizes and shapes, hunting wagons, motor cycles, delivery wagons, cabs, hansoms and victorias.

The cabs, hansoms and victorias alone interested the cabbies; they were elegant of design, rich and simple, and calculated to invite the patronage of the guileless and money spending elite. Experts were forthwith dispatched to Berlin with a view to immediate purchase, while the cab horses in Copenhagen and Stockholm were kept upon small rations in view of their approaching uselessness.

The experts returned home in a month, victims of the delusive catalogues. The motor cabs of Berlin were as unlike the elegant photographs as a western town is unlike the wily auctioneer's flowery description. German autos were as ugly and cumbersome as beer kegs, and they refused to turn corners without big, sweeping curves. The experts next journeyed to France and again returned with spasms of disgust and another tale of woe.



THE ASTER MOTOR.



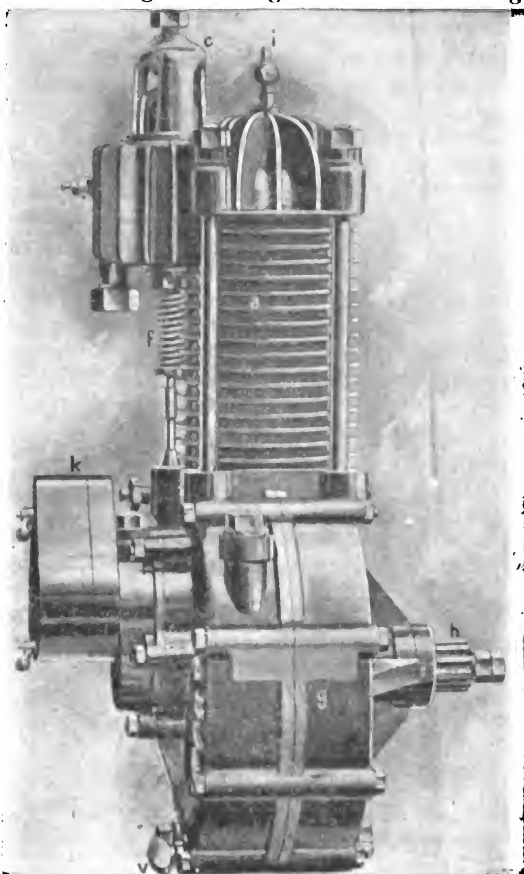
WALTHAM QUADRICYCLE.

De Dion or Aster motors. The motor cycle has been very extensively used in France, but the American mind has turned to the motor carriage, and the Waltham Manufacturing Co. was the first firm to build and market a motor cycle, and a number of their motor tandems were marketed last spring and summer, and were

The Parisian auto, they reported, was pleasing to the eye, but when it got on a road with a layer of sand an inch thick it stopped short and wouldn't go again. Now the cabbies of Sweden are turning longing eyes toward the American catalogue, and are feeding their horses on oats.

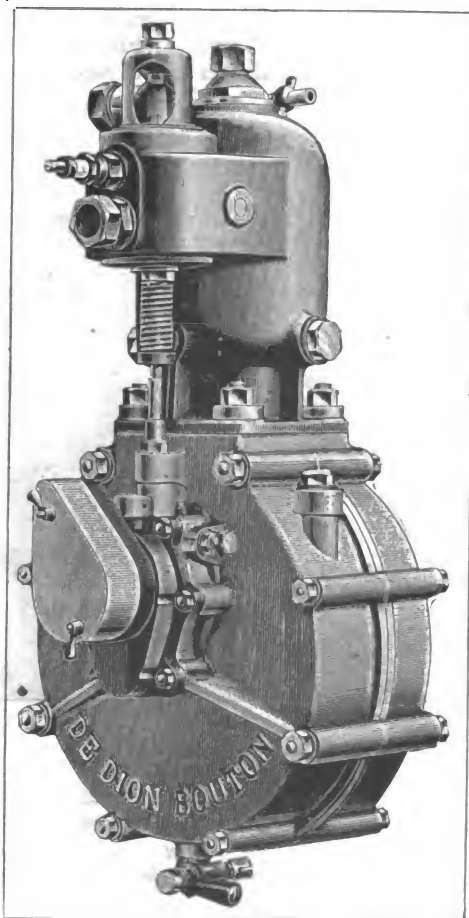
THE DE DION-BOUTON GASOLINE MOTOR.

KENNETH A. SKINNER, of 268 Massachusetts avenue, Boston, Mass., has obtained the United States agency for the sale of the above motor. The success of this motor under varied circumstances places it in the foreground of gasoline motors throughout the



DE DION-BOUTON JACKETLESS MOTOR.

world. A very large percentage of the motor races in Europe and America have been won by machines propelled by this motor. It has the merit of being extremely light, very strong and powerful, and is fitted with appliances of all kinds that will contribute to increase its efficiency. See Mr. Skinner's advertisement this month.



DE DION-BOUTON WATER JACKETED MOTOR.

Descriptions of Automobiles.**THE STRONG MOTOR WAGON.**

(See plate on page 11.)

THE following description of the Strong motor wagon is compiled from a report by A. S. Vogt, chief mechanical engineer of the Pennsylvania Railroad, to J. P. Murphy, general manager of the Union Transfer Co., Philadelphia, Pa.:

In a general way the apparatus contains the following elements: The body, which may be made of any form of material best suited for the particular use to which the vehicle is to be put; the running gear frame, which is built up of tubular elements, generally made of steel, thus furnishing a maximum of strength and stiffness with a minimum weight; the steering and driving wheels, which are made with pressed steel centers and fitted with rubber tires, thereby providing lightness and strength with smooth running and a sure and certain grip on the roadway surface. In all of these respects the vehicle does not differ vitally in principle from such as you are already familiar with. The driving mechanism contains the important and novel features of the vehicle. It may be divided into three separate and independent elements, each performing functions of the greatest importance; they are as follows: The engine, the variable throw crank and the silent propelling and reversing clutch.

The Engine.—This is of the four-cylinder, single acting oil type, the cylinders being arranged in pairs side by side, each pair attached by connecting rods to one of two cranks placed 180° apart, that is, opposite each other. By this means the most nearly perfect balance is obtained with the least possible disturbance from unbalanced forces, and in addition it is possible to keep the engine running at a very slow speed of rotation with no danger of stopping on the dead centers, even when the engine is working under load. The valves controlling the admission and exhaust are of the poppet valve type, insuring promptness of action and tightness, consequently they require little or no attention; they are operated by a weigh shaft so arranged as to be easily accessible for adjustment and with exceedingly small chances for disturbance of the proper functioning of the valves. An important part of the engine is the carburetter, in which takes place the mixing of the air and the oil; the latter being admitted in the form of a spray, is thoroughly mixed with the air and on its way to the valve chamber the mixture is heated by the products of combustion which go through a central passage in the carburetter, the result being that the working fluid reaches the cylinder of the engine in a gaseous form most suitable for perfect combustion.

The Variable Throw Crank.—This device is of very great importance to the successful working of the vehicle as a whole under all conditions and weather. By means of this mechanism the throw of the crank operating the propelling clutch can be varied from a minimum to a maximum, and as a consequence the starting power can be greater than usual, and the steepest hill can be climbed with very much greater ease and less expenditure of stored power than common.

The silent propelling and reversing clutch, taken in conjunction with the variable throw crank, forms a most important element in the success of any automobile vehicle; by their use the speed of the vehicle and the power of transmission may be varied at the will of the operator, entirely independent of the speed of the engine, which may be and in fact is, allowed to run at a constant speed, and is therefore at all time ready to deliver the maximum output of power, thus making it possible to put perfect control of the wagon in the hands of the operator. Since this clutch is of the reversing kind, that is, capable of reversing the action of the propelling part of the clutch, it is possible to allow the engine to run always in one direction, which naturally greatly simplifies the mechanism of the latter.

In addition to these devices the wagon is equipped with the necessary controlling levers and hand brake, all within easy reach of the operator on his seat. All of the mechanism is enclosed and therefore dust proof; no propelling chain, exposed to dust and mud and consequent wear and tear, is made use of; all bearings for which the use of anti-frictional devices are appropriate and advantageous have had such devices applied to them; the lubrication of all frictional surfaces is well taken care of, and friction and wear and tear of moving parts are reduced to a minimum. The hydrocarbon for

use in an internal combustion engine is a commercial article easily obtained in every place of civilization wherever kerosene lamps are used, and its cost is low; the vehicle using an oil engine therefore may obtain its working fluid wherever it may go and at a minimum cost. Consequently each Strong motor wagon is an independent unit, capable of going wherever the roads are at all passable, and capable of replenishing its power at, you might say, any corner grocery store.

UNITED STATES MOTORMOBILE.

(See plate on page 11.)

THE United States Motormobile Co. is a new company engaged in the motor vehicle industry. They are located at 257 Market street, Paterson, N. J. The motormobile is a steam propelled vehicle, the engine and boilers being of special construction, and it is claimed that they are very powerful, although of light weight. The company will devote its attention to the building of light pleasure carriages of artistic design and fine finish.

ST. LOUIS MOTOR CARRIAGE CO.'S PARK PHAETON.

(See plate on page 10.)

THE St. Louis Motor Carriage Co., of St. Louis, Mo., are making a line of motor vehicles propelled by hydro-carbon motors. The one illustrated is intended specially for speed and pleasure riding. It is fitted up with a double cylinder engine of eight horse power. It has 34 in. ball bearing wire wheels on one piece rear axle, running on roller bearings. The wheels are fitted with 3 in. pneumatic tires, or 1 3/4 in. solid rubber tires. Highest speed attained, 18 miles an hour. Will climb a 20 per cent. grade. The vehicle is finished in a first-class manner, and fitted with all the appliances necessary for use on the road.

AMERICAN ELECTRIC VEHICLE CO.'S ELECTRIC TRAP

(See plate on page 10.)

THIS illustration represents one of the latest designs gotten out by the American Electric Vehicle Co., of New York. The wheels are 32 in. front and 36 in. rear, 3 in. pneumatic tires and ball bearing axles. The motor is a three horse power, 24 kilowatt motor. There are forty-four accumulators, of eighty ampere hour power each, rated at four hour discharge. Series or parallel control speed from start to seventeen miles an hour. Painted and finished it makes one of the most attractive vehicles of the kind on the market.

AMESBURY, MASS.

THE Briggs Carriage Co. and John H. Shiels & Co., of Amesbury, have each had orders placed with them by the Locomobile Co. of America, for eleven bodies per day for one year. Shiels & Co. have leased the old plant of the Connors Carriage Co., in which to carry on this branch of the business. Business in general in Amesbury, Mass., is reported to be very good, indeed some of the companies are pushed to fill all their orders. Prices are better than they have been for some time, and the general feeling is one of returned prosperity. With the opening of the spring season there is no doubt but that business will come with a rush to the "City of Fine Carriages."

OFF FOR THE PARIS EXPOSITION.

GORDON M. MATHER sailed for Paris on March 21 on the steamer *Trave*. Mr. Mather is secretary of the Cleveland Axle Co., of Canton, O., and will take charge of the company's exhibit, which will be located on the main floor of the Palace of Civil Engineering and Transportation on the Champs de Mars, serial number 30,424. Mr. Mather will reside, while in the city, at the Hotel Meurice, 228 Rue de Rivoli, at which place he will be pleased to greet American visitors.

TO SAVE THE BIG TREES.

At the opening of the Senate's session, March 6, Mr. Hansbrough, of North Dakota, reported the House joint resolution directing the Secretary of the Interior to place under bond the "Mammoth Tree Grove" and the "South Park Grove of Big Trees" in Calaveras and Tuolumne Counties, California. The idea is that the government should acquire the groves. The resolution was adopted.

Items of Interest.

THE TRIP TO PARIS.

THE committee having in charge the carriage builders' national tour to Europe were unable to secure enough passengers to warrant the chartering of the boat outright, and so will arrange the tour for all who will apply. The magnificent new twin screw steamer, *The Rhein*, of the North German Lloyd fleet, has been secured to carry the delegation. The steamer will sail from New York City, July 3. It has three decks, is 17,700 tons register, and is fitted with all modern appliances for comfort and safety. The rate will be as indicated in the former circulars, \$200 for a week in Paris, all expenses paid, or \$249 for two weeks, one in Paris, and one in London. This will include war tax, deck chair, transfer of baggage, hotel accommodations, tips to porters in European hotels, admission to all places visited by the party, services of a competent guide and interpreter, a carriage drive to Versailles, etc. The accommodations will be first class in every respect, and the carriage makers may feel assured that desirable rooms will be reserved for them under direction and in the presence of the treasurer of the committee. As the accommodations for sale on this steamer are limited, an early reply, with remittance of \$50 for each person, will be necessary, in order to reserve the same, and can be sent to any member which will be referred to the writer. Make checks payable to Monte. L. Green, treasurer, C. B. N. A. Paris committee.

CARRIAGE PAINTERS' SUPPLIES.

WE beg to call the attention of our readers to the advertisement of the George E. Watson Co., Chicago, Ill., which appears elsewhere in this issue. These people make a specialty of carriage painters' supplies, and have issued a net price list which is printed on a sheet 19 x 25, profusely illustrated, and quoting net prices on the various kinds of brushes, japan colors, fillers, pumice and rubbing stone, and in fact everything that is used in the carriage painters' shop. Their aim is to get these to everybody who uses material of this kind, and they will mail them free to anyone using this line of goods. There are very few houses who make a specialty of this entire line of goods. Usually the carriage painter, if he wants to get reliable goods, is obliged to buy his varnish from some varnish manufacturer, his colors from another manufacturer, and usually winds up by buying his brushes and other miscellaneous goods from the hardware dealers, who of course do not make a specialty of these goods, and in the majority of cases pick them up from other sources, so that our readers will thoroughly appreciate and understand the advantages and the saving in expense of freight and express charges by buying these goods direct from people who make a specialty of them, and we would strongly advise any of our readers who have not done so already to send direct to the George E. Watson Co., 38 Randolph street, Chicago, Ill., for one of their illustrated net price lists of carriage painters' supplies and kindly mention this paper.

GENERAL EASTERN AGENT.

THE Calumet Tire Rubber Co., Chicago, Ill., have appointed Mr. John B. Hicks general eastern agent, with headquarters in New York City. Post office address, Box 2298. The Calumet tire has been modified and improved in detail during the past eight months, and is conceded by those who have given it a practical test to be very strong and otherwise durable. Mr. Hicks for a number of years was manager of the railway sales department of the Robert Ingham Clark English varnishes, and he is also well and favorably known in the carriage and wagon trade.

LORING, COES & CO., INC.

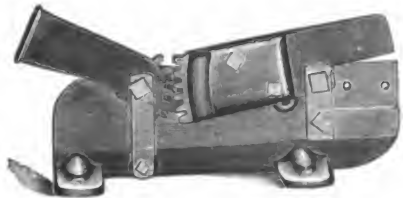
LORING, COES & CO., INC., of Worcester, Mass., manufacturers of machine knives for all purposes, report that they are very busy, and are daily turning out large orders for these goods. This is an old and well known concern, and they make the very best goods in their line. Frank Loring Coes, the vice-president and manager, is an up-to-date man, and under his able management, this company is sure to progress and succeed. They have the reputation of making all goods exactly as they are represented. Anyone in need of goods such as they make would do well to write them for catalogue and prices.

CHANGE OF OWNERSHIP.

We note that G. E. Daniels & Son, manufacturers of wadding and buckram, have been succeeded by Messrs. Ray & Wilson, New York office, 548 Pearl street, Mr. William H. Daniels, selling agent. With improved and enlarged facilities at their mills, Medway, Mass., they are in a most excellent position to supply all the wants in their line.

IMPERIAL SHEARS.

We illustrate the Imperial shears, an entirely new machine having very novel features. Mechanics will see at once how the power is compounded by the position of the fulcrums. Its weight is only thirty lbs., yet it will cut 5-16 thick and ½ in. round iron and soft steel. A hole is provided for cutting rounds. The upper blade



IMPERIAL SHEARS.

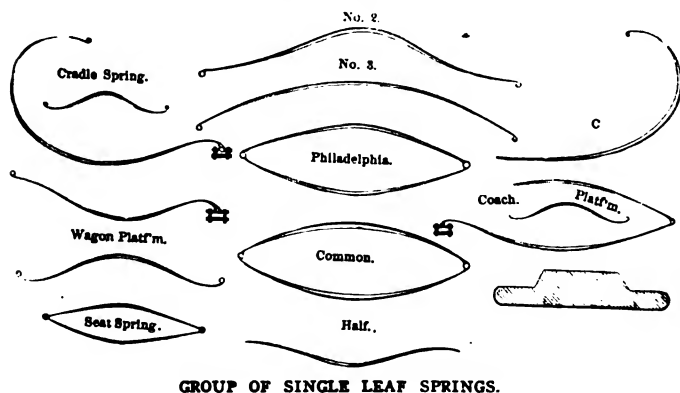
is forged from one piece of tool steel extending back to the cogs. Other shears of same capacity weigh three or four times more and are usually inconvenient. S. D. Kimbark, Chicago, Ill., is sales agent, and will quote prices on application.

PNEUMATIC SURREY.

FOLGER & DRUMMOND, builders of fine carriages and sleighs, Amesbury, Mass., call attention to the light pneumatic surrey, No. 230, shown in their advertisement on another page. They use the Bailey gear, with Hartford tires, 34 and 36 x 2 in.; front spring, 1¾ in., four plates; back spring, 1¾ in., five plates. The body is 5 ft. 6 in. long, 30 in. wide outside seats, fitted with spring cushions, 36 x 17½ in. on top. Width between seats, 15½ in. The rear seat is movable, and the front seat is hinged to throw forward. The trimmings are generally of fine russet leather. Rubber aprons are provided for both seats. From floor to bottom of body, 29 in.; from floor to main step, 20 in. This vehicle is well proportioned and easy riding, and is particularly adapted for one horse.

HENRY SPRING CO.

THE Henry Spring Co., of West Winsted, Conn., manufacture the well known Henry single leaf spring. This spring has been on the



GROUP OF SINGLE LEAF SPRINGS.

market for many years, and the many years' experience in the manufacture of these springs has enabled the proprietor, T. W. Alvord, to produce a superior single leaf spring. Write the company for further information.

REMOVED.

THE Brockett & Tuttle Co., of New Haven, Conn., have removed their plant to 836 Grand avenue, where they will continue the manufacture of the high grade carriages which have given the company so high a position in the carriage world. Frederick A. Ives, who has long been with the company, will manage the business.

SPRING CUSHION.

A. MEISTER & SONS, of Sacramento, Cal., have forwarded us a neat little folder which they are circulating for the purpose of calling buyers' attention to the spring cushion manufactured by Staples & Hanford, of Newburg, N. Y.

IMPROVED SPOKE THROATING AND MITERING MACHINE.

THE illustration herewith represents John Gleason's patent improved spoke throating and mitering machine, of which there are hundreds in use, giving the best of satisfaction. It has an improved cutter head, which will finish the throat in one operation, giving a clean, smooth finish without tearing, and on all sizes and kinds of spokes, common, Sarven, Warner, sharp edge, English and German, and can be changed from one size and shape of spoke to another very quickly. All adjustments are simple and positive in their operation, giving any shape throat desired, and any depth of cut can be had by adjusting the cam, over which the outer end of the spoke travels.

The spoke is placed upon the carriage with the tenon end securely clamped to the inner side of the carriage, and the outer end held in a gauge on the outer side of the carriage by the weight of the operator's hand. The outer side of the carriage being so arranged to travel faster than the inner side, carries the spoke over



SPOKE THROATING AND MITERING MACHINE.

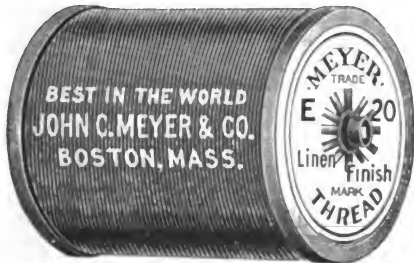
the cutter head in a circular path and regulates the shape of the throat nearest the tenon end. Three cams are furnished, so as to allow any style of throating. This machine will throat between 600 and 800 spokes per hour, according to the style and size of spokes and the speed of the operator in picking them up. This machine is made entirely of iron and steel; it weighs 300 pounds, and is guaranteed to give hard, active service for years. Driving pulley makes 3,500 revolutions per minute. The machine is also arranged to miter patent spokes, such as Sarven, Warner, etc., quickly and in the best manner. A special set of knives is used for mitering patent spokes, and they remain in the head, instead of having to be removed when throating. The machine can be set in a few minutes, giving any desired angle to the spoke. The knives are arranged for a shearing cut, will not chip and will make every spoke perfect. It is made by the Gleason Spoke Lathe & Machinery Co., Philadelphia, Pa.

NEITHER is good work ever done for hatred, any more than hire—but for love only.

A LITTLE TALK TO THE MANUFACTURERS.

ON January 1, 1900, the firm of John C. Meyer & Co. removed from the old place, 87 Summer street, to larger and more convenient quarters, 80-86 Kingston street, Boston, Mass. They now occupy the entire second floor, and the building being new, has all the modern improvements.

Carriage as well as other manufacturers know that the success of the article which they have in process depends largely upon the "little things," for it is the "little things" that go to make up the whole,



and determine largely whether or not said article will meet the approval of the public in general, and thus establish the name of the manufacturer. Now, thread is in itself a "little thing," but poor thread means absolute failure in a great many cases. Customers do not trade the second time with a firm to whom they have paid good money for what they deemed a first-class vehicle, from which, within a week after purchase, the buttons drop off the cushions, the stitch-



ing of the dash rips, and the seams give way. It is safe to say that all manufacturers who are using the Meyer carriage threads feel that they have solved the "thread problem." Of course you have heard of the Meyer threads, but perhaps all of you are not familiar with their special features and for your benefit we will state a few. It the first place, these threads are fade-proof; second, their strength is guaranteed; third, they are made in imitation of real silk, and can scarcely be distinguished from that article when stitched into the



ELLIOT DASH STITCHING MACHINE.

work. They come put up on 2 oz. spools, and are packed 1 lb. in a box, and 50 or 100 lbs. in a case. They may also be obtained on 1 lb. tubes or cones, and are carried in all the leading shades used by carriage manufacturers, and in all desirable sizes. In addition to threads, the firm make a spool silk expressly for the carriage trade, which they carry in all sizes. The company also make a bobbin expressly for the trade, which they wind with any size of thread desired; these are made to fit any style of sewing machine, and give a perfectly uniform stitch, and save money to the user. They are recommended by the leading sewing machine companies. We might also add that this firm carries a thread and spool silk made

especially for automobile manufacturers, of a first class quality and finish. Samples of these as well as of their spool silks and threads can be obtained by dropping a postal to the above address, mentioning THE HUB. We show here a cut of the Meyer carriage trimmers' clip, which we think will be found very useful for holding the leather while stitching. These clips have proved of great service to manufacturers throughout the country. We also illustrate here-with an Elliott dash stitching machine, which has lately come into the possession of the firm. This machine, although second hand, is "as good as new," being in perfect running order; it will stitch all kinds of dashers, sleigh wings and fenders. Write for best price; it's a bargain! Samples will be sent you, free of charge.

RUBBER PAD HORSESHOE.

"AND the horse won't slip" is what is assured to the horse that wears the shoe manufactured by Whitman & Barnes Manufacturing Co., of Akron, O. This horseshoe is made of rubber and steel. The frame is steel—drop-forged—with uneven surface both top and bottom, over which is firmly vulcanized a cushion of rubber which

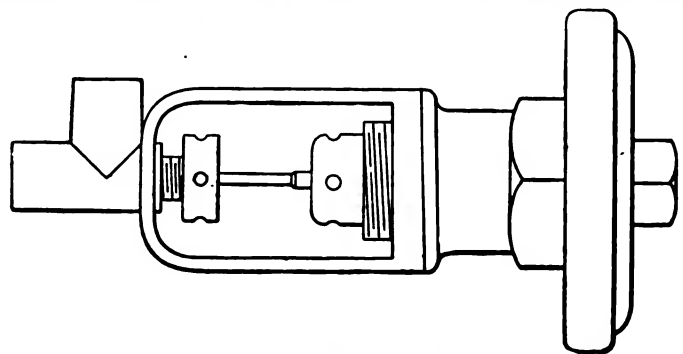


RUBBER PAD HORSESHOES.

fills a channel on the under side, swelling out at the inside of the heels, there making two solid rubber pads, as shown in the cut. The solid rubber pads at the heels prevent slipping, and give frog pressure. The frog and hoof are not covered, but are open to the ground, receiving and retaining from the earth the moisture necessary to keep them in a natural and healthy condition. Send to the company for one of their souvenirs.

STEAM VEHICLE FITTINGS.

THE Locke Regulator Co., of Salem, Mass., are making a full line of steam and gasoline vehicle fittings, all the different parts, such as regulators, valves, gauges, lubricators, try cocks, etc., and they guarantee everything. The company has lately closed a contract



GASOLINE REGULATOR.

with the Milwaukee Automobile Co., of Milwaukee, Wis., for a complete line of fittings for 300 steam carriages. Their working capacity is such that orders can be filled on short notice. Write them for prices and blue prints of such parts as you may want.

CARRIAGES IN MANILA.

THE scarcity of carriages for hire in Manila is a constant and considerable source of trouble. You send out your servant to get some sort of a carriage, because you have to go out; he comes back in half an hour and says he can't get one. Or you get tired of waiting for him to come back; and so you go out yourself. It comes to the same thing. You see an endless squirming procession of carriages crawling and struggling up the Escolta, and when you see one empty you shout, "Oye, cochero, ven aqui!" But he doesn't ven. He just grins.

Then suppose you ultimately do get a quilez. Once in a million times you do. Very good. With an exultation born of the mistaken idea that this world is not so bad after all, and that there are moments when virtue triumphs and patience is rewarded, you get into the quilez.

Then you go in your quilez to your destination, and enter telling the cochero to wait. Perhaps, by way of inducing him to realize that you want him again, you leave your hat and umbrella in his caravan. Wrong tactics; better to take with you the cochero's hat and whip, or, while you are at it, put his horse in your pocket so as to make sure he won't bolt. Otherwise he does, without fail; or some ruffian takes him by force in spite of remonstrance. Statistics have shown that out of 5,723 vehicles that plied the Manila streets last year only one ever stayed while the passenger went indoors, and that was because the pony happened to die. Perhaps he stayed voluntarily and the effort killed him.

We have formed ourselves into a Vigilant Society, with a membership of only one, so far, to keep up a vendetta against cocheros, to take the number of all who offend, and get even with them. If their offenses are of a sort that the law cannot punish, the best way is to watch your opportunity, hire every such vehicle some day, if you have to wait ten years, and then take it out and expostulate with the cochero.—*Manila Times*.

THE SPEEDWAY WHEEL CO.

THIS company is located at Ware, Mass., where they manufacture a line of wire wheels and axles that possess exceptional merit among vehicles in the simple and easy adjustment of the bearings, which differ widely from those of other makes. This company in the

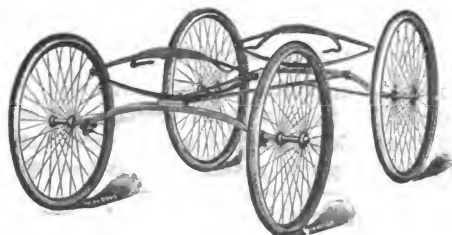


WIRE WHEEL.

past has done a large local business, but the urgent call from manufacturers for their goods has led them to enlarge their capacity and to cater to the wants of carriage manufacturers. They are fully prepared to furnish all sizes and styles of wire wheels and axles with ball bearings, and would like to hear from manufacturers of pneumatic vehicles.

PNEUMATIC GEARS AND ROAD WAGONS.

THE Fitch Pneumatic Gear Co., Rome, N. Y., are manufacturing bike gears and wagons in the white, with wood hub wheels and



PNEUMATIC GEAR.

hard rubber tires. They call special attention to their wood hub pneumatics and long distance Collinge axles.

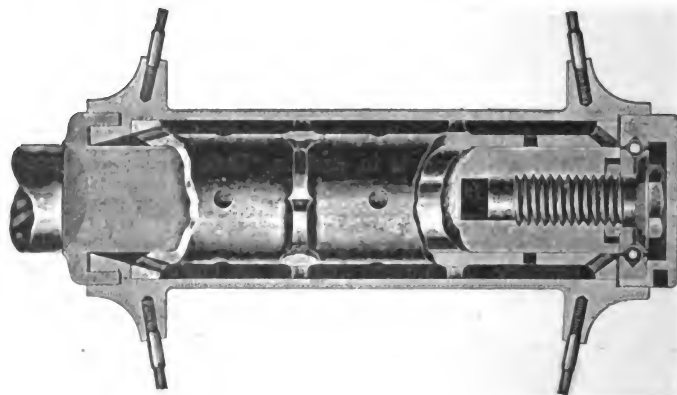
WEST'S TIRE SETTERS FOR THE ARMY.

PERHAPS the readers of THE HUB would be interested to know that "West's" tire setters are in demand in times of war as well as in times of peace, and the London syndicate in charge of sales in the

principal European countries has sold several of these machines to the English government for use in the army, and two of these machines are now at the front in South Africa. We are also informed that there is a good prospect for several orders for light steel machines for army use, the plans having already been submitted to the English government for approval. This is not the first introduction of these machines in Africa, however, the first sale having been made in South Africa several years ago.

THE MORRILL & WELLS AXLE.

THE illustration herewith shows a new axle brought out by Osgood Morrill, of Amesbury, Mass. Before putting it before the public it was thoroughly tested. One trial was an eight and one-half months' run, during which time it ran 1,000 miles. A single tablespoonful of castor oil was put in at the start, and at the end there was nearly as much oil in the reservoir as at the beginning. This



THE MORRILL & WELLS AXLE.

was due to the peculiar construction of the reservoir, that allows the oil to pass in on the arm and flow back into the reservoir, thus maintaining a perfect lubrication without waste, as not a drop of oil can escape at the ends. By an arrangement of a thrust ball bearing the use of washers is dispensed with and friction is overcome at the ends. There is so much that is novel, and everything appears so practical, that the trade should investigate its merits.

CATALOGUES RECEIVED.

AN exceptionally neat catalogue has been issued by the Brown Carriage Co., of Cincinnati, O., in which they illustrate a line of surreys, canopy extension and no top, phaetons, jump seat buggies and a line of buggies, top and no top, forty-four in all, also samples of striping, colors, etc., all fully described, enclosed in an emblematic cover.

The Michigan Buggy Co., of Kalamazoo, are sending out their 1900 catalogue, containing fifty-four illustrations of buggies, stanhopes, phaetons, surreys, Concord and pony vehicles, some of which are standard styles, others up-to-date patterns of driving vehicles, with full descriptions of construction, colors, etc. It is oblong in form, and is enclosed in a green and gold embossed cover. They have mailed 20,000 copies of this catalogue.

Pontiac Buggy Co., Pontiac, Mich., are sending out a folder with a print of their bike wagon. This company are paying special attention to a fine grade which they designate as "Western Amesbury Line." Send for their catalogue.

Zimmerman Manufacturing Co., of Auburn, Ind., manufacturers of high-grade buggies, surreys, gentlemen's driving wagons, phaetons, etc., have put out a very neat catalogue, showing illustrations of thirty styles, accompanied by full descriptions of the same. Cover in blue bronze and gold, embossed. Send for a copy.

Pony vehicles in numbers and in variety of styles, embracing carts, surreys, phaetons and sleighs, together with clear descriptions of the same, constitute the contents of the 1900 album issued by Walborn & Riker, of St. Paris, O., manufacturers of vehicle specialties. It is a pamphlet of sixty pages, fully illustrated and neatly printed. Every dealer should write for a copy.

Walter W. Woodruff & Sons, Mount Carmel, Conn., have issued their 1900 supplement to their 1898 catalogue, in which they show new lines of carriage goods, such as door locks, whiffletree plates, pole crabs, clips, etc.

Carriage Lamp Catalogue, No. 6, has been issued by the White Manufacturing Co., of Bridgeport, Conn. In it are illustrated lamps for every style of vehicle, and in a great number of patterns, in-

cluding standard and popular styles, new designs and novelties. Prices and general descriptions are given. No vehicle manufacturer should be without a copy.

Woods Motor Vehicle Co., of Chicago, Ill., have issued an illustrated catalogue showing their motor vehicles in colors and the occupants in summer attire. It is the most elaborate work of the kind yet issued by automobile manufacturers, and is more artistic than most attempts of this kind of color work.

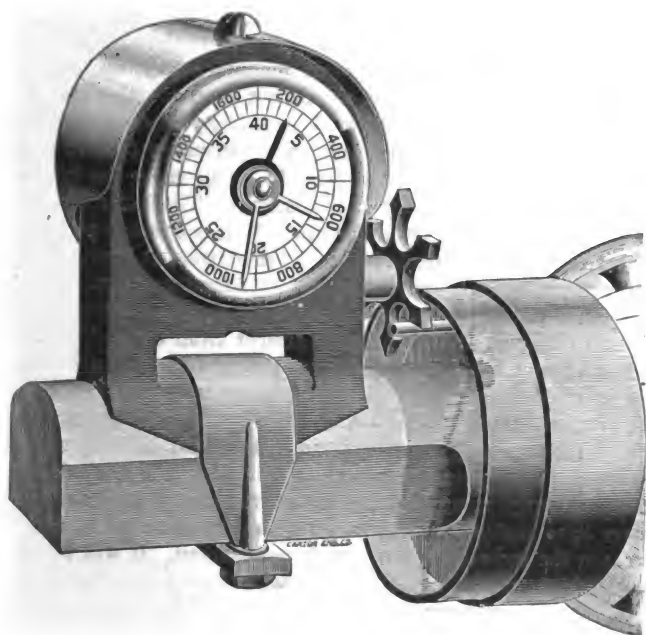
The Locomobile Co., of New York City, have issued a handsomely printed and comprehensive descriptive catalogue, illustrating their locomobiles of different types, such as surreys, racers and standard styles. It will prove valuable to all who are interested in motor vehicles.

HORSESHOERS' AND BLACKSMITHS' MEETING.

THE first annual meeting of the horseshoers and blacksmiths of Indiana will be held in Peru, Ind., on April 25. The day's programme consists of lectures, speeches and receptions. A ball will be given in the evening. A large attendance is expected.

THE BELL ODOMETER.

THIS odometer, manufactured by S. H. Davis & Co., of Boston, Mass., is designed to register the distance traveled by carriages. It is fastened to the axle, and is operated by a steel pin driven in end of hub. This pin propels the mechanism of the odometer with each revolution of the carriage wheel. On starting out, the position of the indexes may be quickly marked on a dial card—a number of which are furnished free with each odometer—and on returning from a drive the distance traveled may be seen at a glance. When a mile has been passed the fact is distinctly announced by one sharp stroke of a small bell in the odometer. With this exception, the



ODOMETER.

instrument is absolutely noiseless. The odometer is so constructed that its record cannot be changed. While the red index may be moved in either direction the recording indexes remain stationary, except when moved continuously forward. It is simple in construction, positive in its movements, and is so enclosed in a metal case that it cannot be injured by any ordinary use. They are made for wheels of any size from 28 to 60 inches diameter, varying every half inch. In sending orders it is necessary to send the exact diameter of the rear wheel of carriage, measured with a tape alongside the hub, from outside to outside of tire. The odometer should be placed on the axle close to the rear right-hand wheel, and facing back. Explicit instructions, record cards, and steel pin are sent with each instrument. Adapted for automobile work where it can be applied. The company has recently moved to 44 Portland street.

EASTERN OFFICES.

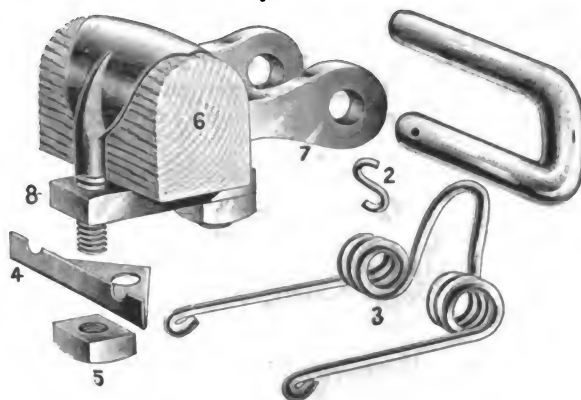
THE Terre Haute Carriage & Buggy Co., of Terre Haute, Ind., have established eastern offices, warerooms and repair shops at 302 to 308 West Fifty-third street, New York City, and 237 to 245 South Twelfth street (Twelfth and Locust), Philadelphia.

THE SQUIRES CARRIAGE CO.

THE assignee of the J. O. Greene Carriage Co., of Cleveland, O., has sold the entire stock and plant to the Columbus Buggy & Wagon Agency, 20-30 Bolivar street, Cleveland, O. H. D. Squires, the manager of this company, advises us that they will operate the new plant under the name of the Squires Carriage Co., and that they will carry a complete stock of highest grade vehicles and harness. This concern reports a very prosperous business for last season, they having sold 400 vehicles, and this year expect to sell 1,000 jobs. They will also put in a line of automobiles.

STAR QUICK SHIFTER AND ANTI-RATTLER.

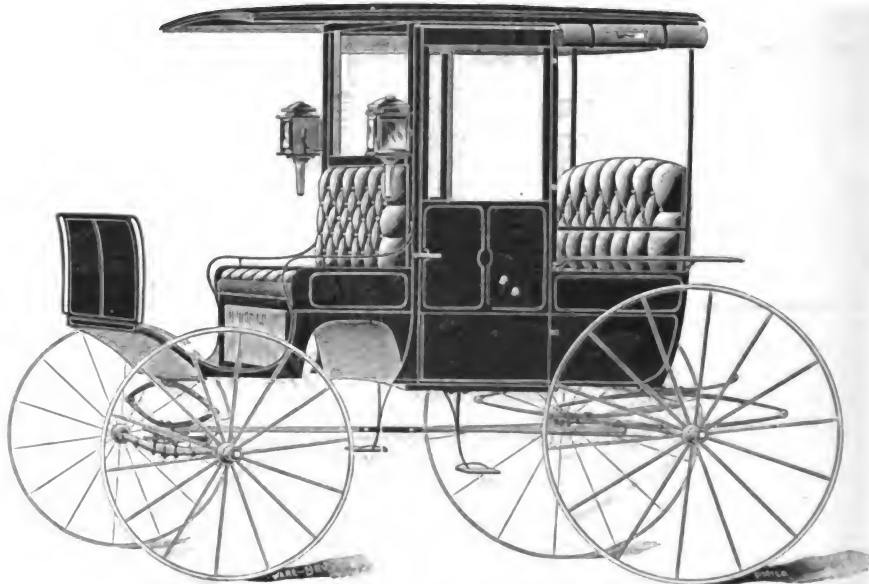
THE Star quick shifter and anti-rattler, manufactured by the Star Manufacturing Co., of Princeton, Ill., has so much to recom-



mend it that we feel we are doing the carriage trade a good turn by calling their attention to these shifters. Write for a sample set.

J. A. LANCASTER & CO.

J. A. LANCASTER & Co., of Merrimac, Mass., are among the most active and progressive of our eastern wholesale manufacturers. Among their specialties is the "station wagon," one of the styles of which is shown herewith. They make four or five other styles of this popular vehicle, and have a good trade in them. They also



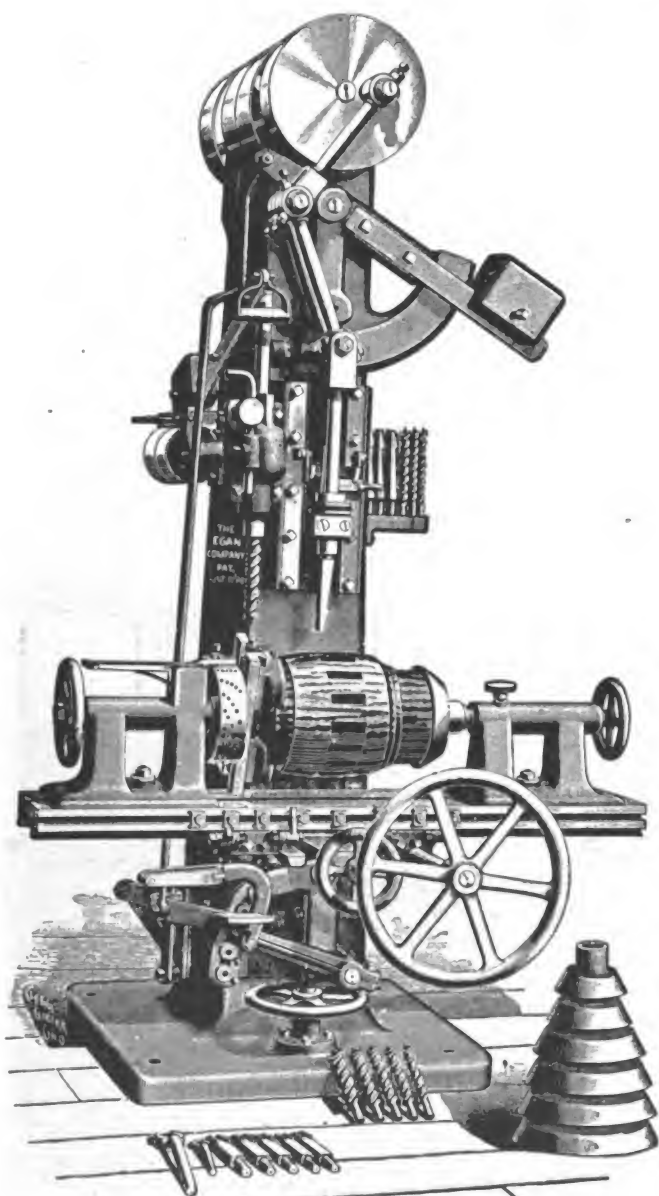
STATION WAGON.

manufacture a line of pony rigs, which this spring are selling faster than they can build them, so much so that they are unable to retain sample jobs in the warerooms. Dealers who handle the Lancaster vehicles find them ready sellers, and consumers are always well pleased. The company aim to be in the front rank in the styles and finish of their vehicles.

PLEASANT civility is the most potent factor in the successful conduct of business, and the person whose nature evolves it naturally has a great advantage over the one who is obliged to manufacture it from policy.

HUB BORER AND MORTISER.

WE present here a cut of a machine designed and manufactured by those prolific producers of all descriptions of high-grade wood-working machinery, the Egan Co., 421 to 441 West Front street, Cincinnati, O. It is their New No. 5 Hub Mortiser and Borer. This new machine has 6 in. graduated stroke to the chisel mandrel. It is capable of mortising from the smallest buggy hub to a 14 in. wagon hub, either straight or staggered. The column is cast in one piece, with the tight and loose pulleys running between heavy bearings, making a very strong and reliable machine, and one that will stand up to the very heaviest kind of work. The chisel mandrel is made of the best cast steel, connected to one solid ram, working in planed ways, making it impossible for the mandrel to spring when mortising the hardest kind of wood at the full stroke. The patent reverse can be used automatically or can be controlled by the operator at will, and is a very convenient arrangement for general work. The chuck for holding the hub is spaced off to mortise for ten, twelve, fourteen, sixteen and eighteen spokes to the hub, either straight or staggered. One end of the hub is held by two jaws, operated by a right and left hand screw, while the other end of the hub rests in a cup of suitable



HUB BORER AND MORTISER.

size. The radial slide is entirely new, and covered by letters patent. It is attached to the connections and operated by the treadle, and prevents the slightest jar on the foot, even when mortising without first boring a hole to admit the chisel. This has never been accomplished heretofore on a machine of this class. The bed is of large surface, made to cut a straight or angle mortise, and provided with a new adjustable clamping device for holding the work to the bed. Suitable provision is made to angle the table, without interfering with the raising screws. The boring mandrel is connected with the column and driven by a pulley at the top of same, making the

machine self-contained in every respect. The boring bit is placed in line with the chisel and a suitable stop is provided for gauging the depth of boring. A counterweight is provided for lifting the boring mandrel up out of the way, when not in use. No greater proof of the superior quality of the wood-working machinery made by the Egan Co., of Nos. 421 to 441 West Front street, Cincinnati, O., could have been given them than to have had the government request that they represent the United States at the Exposition to be held at Paris this year. It is needless to say they are going to do so, and in a manner well calculated to uphold the prestige of the nation for high-grade machinery. American-made wood-working machinery has for years been taking a firm hold on the manufacturers of the world, and the splendid exhibit which will be made by the Egan Co. at the Paris Exposition will, without doubt, only tend to increase the good opinions already entertained for these products of American skill and ingenuity. One of the reasons of this firm's great success is that they have the happy faculty of finding out what the trade demands, and of producing a machine to meet it.

BUSINESS METHODS IN SOUTH AMERICA.

OUR manufacturers should familiarize themselves with the methods of business in vogue in South America, and especially in regard to terms of payment, etc. According to advice received from a prominent importer in Buenos Ayres, as mentioned by the *New York Commercial Bulletin*, much is to be acquired by our manufacturers regarding the methods of doing business there. An agent wrote to the Buenos Ayres importer in the interest of the various out-of-town manufacturers he represents for export, endeavoring to introduce his wares. In some instances the agent was obliged to follow instructions from his firms as to the matter of payment, which was stated to be cash against bills of lading. To this particular clause the importer, who, by the way, is one of the largest in Argentina, replied that only American manufacturers suggest such terms. Similar European firms would not even mention them; in fact, their prices and terms were always ninety days, six months, and in some lines nine months, leaving the privilege of a cash discount at the option of the importer. In many cases the importer said advantage is taken of the cash discount. The letter also adds that it would be well for manufacturers in this country to bear in mind that the purchases made by import merchants at Buenos Ayres are larger than those of any other South American port. The interior towns in Argentina are practically supplied from Buenos Ayres and Rosario. Merchandise in transit from either Europe or the United States takes so long to reach there that they are obliged to buy in much larger quantities than other countries. In certain lines of manufactured products a stock is put in only twice a year, and from the two seaports mentioned distribution is made all over the country. The same concern adds that while the United States is advantageously competing in some products, American manufacturers have not yet learned to cater to Argentina trade, and for that reason the increase in business is not marked. It will be many years before American manufacturers will treat foreign purchasers with the same confidence as those at home. The letter also says that if American manufacturers would take advantage of the information at their command for ascertaining the standing of foreign firms, and particularly those of Argentina, they need have no fear.—*Implement Age*.

DEXTER SPRING & GEAR CO.

THE Dexter Spring Co., of Pittsburg, Pa., will hereafter carry in stock, ready for finishing, regular sizes of elliptic buggy springs. This will be a great convenience to the trade, as it will enable the company to ship orders on a day's notice.

COACH AND AUTOMOBILE LAMPS.

MR. E. E. PECK, of the Scoville & Peck Co., New Haven, Conn., has just returned from a month's trip through the West, and reports business exceptionally good in his line, which is high grade carriage and coach lamps. He has been especially successful in his electric lamps for automobiles, which he claims to be the most efficient, and owing to their particular construction least complicated, of anything on the market.

AN ATTRACTIVE SHOW IN PHILADELPHIA.

JOHN WANAMAKER recently had an exhibition of harness in his mammoth establishment which drew thousands of lovers of the horse there. The display was well gotten up, and made more inviting and attractive because of the addition of carriages and display-horses. The latter were harnessed to the various styles of vehicles, and wax figures of life size held the reins. Following are the concerns whose carriages were used for the occasion:

The Gregg Carriage Co., one surrey, one basket phaeton, one basket cart, one runabout.

A. Geissel & Sons, one landau of latest design, thrown open.

Charles S. Caffrey Co., one 28-lb. sulky, two very light bike wagons, with low wooden wheels and pneumatic tires.

Collings Carriage Co., one cut-under rockaway, one doctor's carriage.,

Near the harness exhibit were several electric carriages, one of which was a well-shaped brougham, built by Petzelt & Keyser, of Philadelphia. The style and finish of each and every one of the vehicles reflect great credit on the Philadelphia carriage fraternity.

JOHN H. SHIELDS & CO.

JOHN H. SHIELDS & Co., of Amesbury, Mass., manufacture a line of specialties that have won for the company a high reputation among city buyers. We illustrate herewith a four passenger road wagon



FOUR PASSENGER ROAD WAGON.

on a Bailey gear, furnished with Hartford or Diamond tires. This vehicle is finely painted, and trimmed with whipcord, Bedford, or cloth. Spindle seats or cane seats may be used.

RUSTY CURTAIN FASTENER NUISANCE.

THE appearance of a vehicle is sometimes completely spoiled, even after but short service, by the heads of the curtain fasteners becoming rusty. This happens when they are made of iron and are carelessly enameled. To overcome this difficulty Crandal, Stone & Co., Linghamton, N. Y., have gotten out a line of fasteners with heads made of solid white metal which will not rust. These are giving entire satisfaction. Their catalogue No. 15 illustrates the complete line, which they term their "I. X. L." brand.

WELDING COMPOUND.

THE demand for welding compound in the carriage, wagon and blacksmith trade is growing every year. Much importance should be placed on the quality used, as good or poor results are dependent upon this point. The "Climax" has had a successful career for a



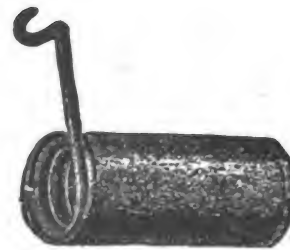
number of years, and is still giving very satisfactory results. It is especially adapted for tires and axles. A sample for trial can be had for the asking from the Cortland Welding Compound Co., Cortland, N. Y. The leading dealers in carriage hardware keep it in stock.

POSTAL MONEY ORDERS TO RUSSIA.

ANOTHER illustration of the up-and-doing policy of the present Russian government is found in the outcome of a recent convention between representatives of the Postal Department of the United States and those of the Russian empire, whereby on April 2 next, for the first time, will be established direct exchange of money orders between the two countries. They will not, however, embrace Finland or Asiatic Russia. The regular international form, receipt, coupon and letter of advice will be used, but payment in Russia will be made on a special form printed in the Russian language, which will be forwarded direct to the payee. The regular international rate of charges up to the \$100 limit, which runs from 10 cents to \$1, will apply to the new money orders. The exchange post offices for money orders of this sort are New York City and Kibarty, Russia.

STRONG SELLING POINT.

IN these days of keen competition salesmen often find that some practical appliance used on the buggies they are handling turns an order their way. Several times we have called attention of both builders and dealers to this matter in connection with the buggy prop springs and levers made by Cately & Ettling, Cortland, N. Y. We consider this little device one of the best selling points of a top



vehicle. If you don't use them, maybe that is the reason your sales are not as large as you would wish. Most of your competitors have adopted them and are ordering in large quantities. They add but a trifle to the cost of a buggy, but they oftentimes clinch an order.

PROTECTION OF INVENTIONS EXHIBITED AT PARIS.

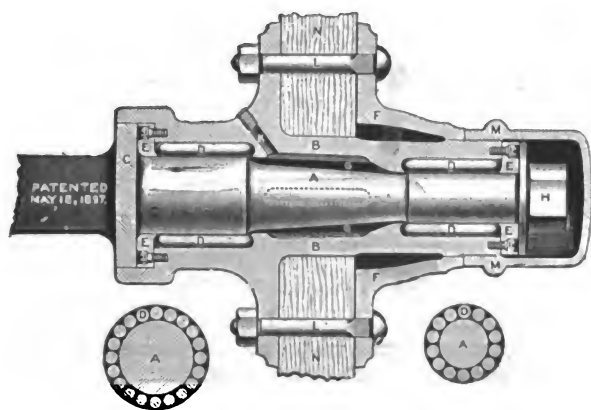
THE Paris Exhibition will be officially opened on April 15, 1900. Many inventors will take advantage of this opportunity to bring their productions to the notice of the large crowds of visitors that are expected to come to the French capital from all countries of the world. According to the French patent laws, public disclosure of an invention before the filing of an application for a patent, often deprives the inventor of his right to a valid French patent. The law of May 23, 1868, provides, however, that inventions exhibited at international expositions may be protected, as if they were patented, from the time they are received at the Exposition, until three months after the closing of the exhibition. This temporary protection is secured by depositing a specification and drawings of the invention, together with a certificate stating that the object has been admitted as an exhibit, at the office of the governor (préfet) of the Département de la Seine. These documents must be filed within a month after the opening of the Exposition, that is, before May 15, 1900. The exhibition of the model will be no bar to the securing of a French patent.

Persons who have already secured French patents will secure material benefits by exhibiting at the Paris fair. The French patent laws allow the privilege of importing patented goods into France only to citizens of certain countries, while Germans, Russians and others would lose their French patent rights by such importation and would, therefore, be prevented from exhibiting their patented manufactures. The law of December 30, 1899, however, allows all foreigners to import any patented article into France for the purpose of exhibiting it at Paris, without endangering the validity of their French patents, provided these exhibits are again exported from France within three months after the close of the Exposition. Another provision of the law of December 30, 1899, which will be valuable to all foreigners, including our own citizens, makes the exhibition of a patented invention at the Paris fair equivalent to manufacture in France, and as the French patent laws require that the manufacture should not be interrupted for more than two years, it will be sufficient for exhibitors to again manufacture their inventions in France within two years after the close of the Exposition.

Furthermore, exhibits cannot be confiscated on account of alleged infringement of patents or trademarks, until three months after the close of the Exposition, but they may only be held temporarily, without withdrawing them from the Exposition. Even this temporary relief, however, will not be granted unless the complainant enjoys protection for his invention or trade mark in the alleged infringer's country. Should such infringing articles be sold in France or remain there more than three months after the close of the Exposition, they will become liable to seizure.—*Scientific American*.

ARCHIBALD WHEEL CO.

THE Archibald iron hub wheel, manufactured by the above company at Lawrence, Mass., possesses special merits for heavy work. The United States Government is now using these wheels on ordnance from four inch axles for five inch siege guns down to those for the lighter field and machine guns. They have proved equally successful on steam fire engines, where the strain is equally severe as that of ordnance. But their use by no means stops here. Wherever heavy wagons or trucks are required, there the Archibald wheel finds a place and its durability is recognized. The company are in receipt of numerous testimonials speaking in unqualified terms of



ARCHIBALD HUB WITH ROLLER BEARINGS.

their wheels. In addition to the plain spindle, the company fit up their hubs with Brown's roller bearings, as shown by the illustration herewith. One severe test showed great superiority for the axle fitted with the roller bearings, making them a valuable addition to the hub, although as yet they constitute a small part of the company's output. The company use the best of New England second growth stock in their felloes and spokes, and carry a full three years' stock of seasoned timber ready for use, which enables them to fill orders promptly. Wheels can be purchased with or without tires. It will be borne in mind that in these wheels the box constitutes a part of the hub, and the price includes the boxes and boxes set. All have a screw cut on front end of hub for brass caps, unless otherwise ordered. The size of spokes is, as a rule, the same as diameter of axle.

POSSIBLE AND IMPOSSIBLE EFFECTS OF THE CURRENCY ACT.

It is likely enough that a number of State and private banks located in the country towns will apply for charters under the national banking act, the passing of the currency and refunding bill having considerably modified the disadvantages which have hitherto hindered the growth of that system. The amended act permits (1) banks of \$25,000 capital to be established in towns of less than 3,000 inhabitants; (2) it permits the issue of circulation to the par value of the bonds deposited to secure it, instead of 90 per cent., as under the superseded act; (3) it reduces the tax on circulation from 1 per cent. to $\frac{1}{2}$ of 1 per cent. The one factor which may nullify these advantages, however, is the cost of the bonds. The new 2 per cents are already quoted at 107, at which price they yield about 1.70 per cent. net. From this the $\frac{1}{2}$ of 1 per cent. tax on circulation must be deducted, together with other items of expense in taking out notes, which include the cost of plates, expressage and charges for redemption, etc. The 5 per cent. redemption fund which national banks having circulation must deposit at the Treasury is not included in the cost, since that fund is counted as part of the required cash reserve, and could not be loaned anyhow. Even if procurable at par

the income per cent. on bonds used for circulation falls below $1\frac{1}{2}$ per cent., which the advance of the premium may easily eliminate.

Granting, however, a comparatively slight advantage from the taking out of circulation on the bonds at the current premium, is this all that a country private or State bank needs to consider before applying for a national bank charter? While the new law makes a concession to the resources of the smaller towns by way of the capital required by a national bank, it does not make any concession to a large part of the necessary business of most country banks. A national bank is not permitted to loan money on land security. This prohibition as much as the original capital requirement, has tended greatly to limit the extension of the national banking system. The national banking act forbids the loaning of more than 10 per cent. of the capital to any one individual. This restriction, whatever worth it has by way of promoting conservative banking, is sure to be a stumbling block to many country banks, whose capital did not exceed the \$25,000 limit. The fixed cash reserve of 15 per cent. of deposits may not be of general importance, but it will certainly prove a factor to be reckoned with in a great many cases.

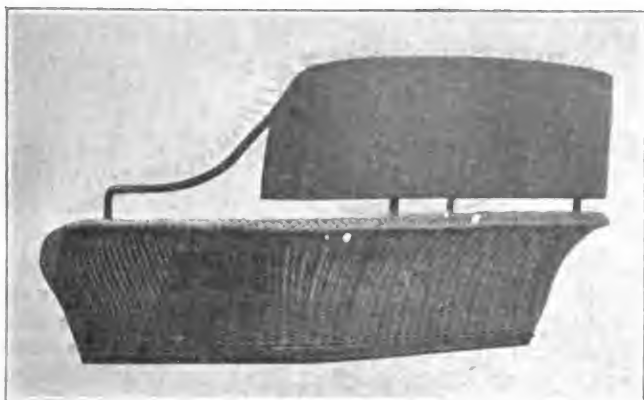
Exaggerated ideas prevail in many quarters concerning the amount of national bank currency which the bill will make probable. These vary from \$800,000,000 down. In the Senate the critics of the bill expressed a fear that the inflation would be so great as to drive gold out of circulation. In the first place, whatever circulation will be taken out cannot be secured at once. This is a physical impossibility. It takes time to prepare plates for the notes, and the resources of the Bureau of Engraving and Printing are limited. Then, the amount of bills which will be called for immediately by banks having bonds already on deposit for existing circulation is limited to 10 per cent. additional, which at most does not involve more than \$25,000,000. Then, as the Treasury pays the premium on the exchange, if it pays this out of United States deposits now in the banks, it releases an equivalent amount of bonds. As the banks get these back, they may apply for circulation on them; but in any case, the circulation would not exceed the paid up capital of the bank applying for it. Thus for example, if the National City Bank surrendered its government deposits its \$17,000,000 United States bonds would be returned; but it could not issue more than \$10,000,000 circulation, that being the amount of the bank's capital. Moreover, some of the bonds pledged for government deposits were borrowed by the banks during the recent stringency for the purpose of getting ready cash. These will be returned, as they are released, to their real owners, who are mostly private persons, savings banks, insurance and other corporations, who, of course, cannot issue circulation on them. Even if the banks owned all the bonds pledged for public deposits, and there was no limit to the issue of circulation by them, the amount of bills issuable at the return of these bonds does not exceed \$90,000,000; so that at most, including the \$25,000,000 of certain increase, we have a potential inflation of \$115,000,000, which it will take some time fully to get out.

A curious notion is going the rounds of the press, to the effect that national banks can be organized for purely speculative reasons, with no greater amount of permanently invested capital than the premium on the bonds secured for circulation. Leaving the premium on the bonds out of consideration, the idea presents itself as follows: \$25,000 is borrowed to organize a national bank; this is invested in \$25,000 government bonds; these bonds are deposited with the Treasury in exchange for \$25,000 circulation; this circulation is immediately used to pay back the borrowed money. Thus a bank has been organized by persons having practically no capital at all! When the national banking system came into being there were numerous reports of proceedings of this character. In fact, the possibility of operations of similar kind found a basis for the criticism of the national banking act when it was under discussion in the Senate early in 1863. In 1878 it was revived in a remarkable document, purporting to be the statement of one James O'Neal, who declared that, beginning with a capital of \$100,000, he had organized ten national banks in as many States during the period between 1865 and 1874, using the circulation issued on the original deposit of bonds as the basis for a new bank, and so on. But the Controller of the Currency, to whom this matter was referred, found no such person as James O'Neal. But suppose it should be done, where is the advantage? The money has been invested in government bonds and the circulation has been used to pay what was borrowed. The circulation is fully secured by the bonds, into whatever hands it comes afterward. Five stockholders of the bank there must still be; and these are liable to depositors for double the amount of their stock.—*The American Banker*.

PEOPLE of good sense are those whose opinions agree with ours.

HEYWOOD BROTHERS & WAKEFIELD CO.

THE novel and beautiful effects that may be produced by employing rattan work in any style of carriage are increasing its popularity, as any desired lines can be carried out, either in complete bodies, seats, dashes, wings, etc. Heywood Brothers & Wakefield Co., Boston, are known as the largest manufacturers in the country of reed and rattan furniture and specialties, and in the construction of carriage work are employing the most skilled labor and the highest



CANED SEAT FOR CARRIAGE.

grade of materials. The proper construction of the iron frames for this work is a very important item, and Heywood Brothers & Wakefield Co. will gladly furnish drawings showing the general points which should be observed. Particular attention is given to the execution of orders calling for special designs. In addition to the novel effects that may be obtained from the use of complete reed bodies or seats, reed panels may be employed in bodies otherwise constructed of wood. For use on light traps and carts there is nothing that will supply a more pleasing and substantial novelty, at a moderate cost to the carriage builder.

AUTOMOBILE WHEELS.

WHILE perfection in automobiles, in the way of motive power and general construction, is aimed at by all manufacturers, it is extremely important that the durability of the wheels should be considered of prime importance. Since the year 1884 the Weston-Mott Co., Utica, N. Y., have made a study of wire wheels for carriages, and their products have long been considered practically perfect. They are now making a line of wire wheels for automobiles with the same skill and care as are used in the manufacture of their carriage wheels, and their catalogue, showing illustrations and specifications, will be sent free to anyone mentioning THE HUB. Their ball bearing automobile steering device is also in popular demand.

THE IDEAL AUTOMOBILE.

THE automobile has been sufficiently long in our midst to enable us to define the essential qualities which go to make up an ideal machine. Naming them in their order they are as follows: Low cost, durability, endurance (large fuel supply), ability to climb hills, and speed.

Low cost is given the first place for the reason that the present price of the automobile places it altogether beyond the means of the average individual, and renders it a very decided luxury. It is certain that cheapening the cost will produce a proportionate increase in the demand, and the increased demand will lead, in its turn, to a reduction in the price. This was conclusively proved in the history of the bicycle, the cost of a first-class machine to-day being about one-quarter what it was a few years ago, when the number of riders was limited.

But while the ideal automobile must be cheap, the reduction in price must not be gained at the expense of sound materials and good workmanship. However great may be the demand for a low-priced machine, our manufacturers must never attempt to meet it by making a short cut by the way of showy, but inferior construction. The folly of such a method was demonstrated very conclusively when the bicycle was at the height of its popularity.

Next to its low cost and durability we place the endurance of

the automobile; by which we mean its capacity to cover a large mileage without having to refill its fuel tanks. Liberal fuel capacity will be a very strong recommendation to the bicyclist, who has been accustomed to rove all day on long-distance excursions, with the knowledge that he is not tied to particular stopping places, or liable to be hopelessly "stalled" by a collapse of his motive power in out-of-the-way or unexpected places.

In view of the fact that the steam-driven automobile has shown such superior hill-climbing powers, it is certain that the appetite of the public, being thus whetted, will demand that the ideal automobile shall be able to negotiate any hill that it may encounter in the course of an extended tour. It must be able to carry its occupant through, if need be, a mountainous country; for we have a precedent in the successful trip up Mount Washington recently accomplished by a builder in one of his own machines. The records for hill-climbing are at present held by steam-driven motors; and it will be a fortunate day for the automobilists when builders succeed in combining with the cheap cost of operation of the gas-propelled type the hill-climbing powers of its strongest competitor.

In placing speed at the bottom of the list we may seem to be making too little of a feature of the automobile which many of the riding public believe should receive the first consideration; but as a matter of fact every type of automobile that is now on the market is capable of running at a higher speed than the law allows. Although a rate of twenty miles an hour or more is no doubt frequently accomplished on the public roads, there is no question that the rapid increase in the number of riders in the future will lead to a restriction of speed to a maximum of twelve or fourteen miles an hour.—*Scientific American*.

ENERGY AXLE OILER.

It is an article of thorough mechanical construction, and is made from the best and strongest materials. With reasonable usage it will last more than a lifetime. The pump cylinder is $1\frac{1}{8}$ in. diameter, from seamless brass 1-16 in. thick. Lower valve and piston head are from best gray iron, accurately turned. Handle and piston-rods 5-16 and 11-32 in. steel. Upper valve $\frac{3}{8}$ in. bicycle ball, resting on



polished brass seat. Finger bar and hand rest malleable white iron. Nozzle combination of brass, leather and iron. The points that recommend it are simplicity, quick delivery of oil, without the possibility of grit, absolute control, so that the operator can instantly regulate the quantity of oil, whether thick or thin, and cleanliness, as no oil can escape except through the tube. It is manufactured by David True, Amesbury, Mass.

THE happiest life is that which constantly exercises and educates that which is best in us.—*Hamilton*.

VEHICLES IN HAVANA.

(Continued from page 28.)

as high, heavy and wide as can be made, requiring extra forces of men to load them. The very clumsiness and ungainliness of this freight cart makes it altogether anomalous with its surroundings. It often becomes a source of annoyance and delay, the narrow streets being blocked so completely that it not infrequently is found to be necessary to drive several squares out of the way to get around a blockade. The methods of loading and unloading are so primitive that a great deal more time is consumed in this work than is necessary, thus continuing cart blockades very much longer than would be required if modern methods were employed.

A special feature of interest in this department of Havana vehicle life is the motive power. Mules are employed exclusively, and splendid mules at that. Some of them seem too small to draw their enormous carts empty, even; but they are well fed, sleek as they can be made to be, and labor with an energy quite paradoxical in this climate. Many of the mules are unusually large and fine-looking fellows. I have seen some here larger and finer than any in the States. The best specimens are said to be from Spain, but it is noticed that many of them bear at least the earmarks of the Kentucky hybrid. In value the best ones are classed high—as high as \$1,000.

An additional feature of interest is the trappings with which Havana mules are caprisoned. Some of the harness seen in the wholesale districts costs as much as the wardrobe and earthly possessions of the driver and his whole family. Bridle, hames, saddle and surcingle are decorated with flaming red tassels of prodigious size, while every strap in the outfit is studded with brass-head tacks and metal mountings, all of which are kept as spick and span as a city doctor's door-plate. Heavy cart saddles, heavier than the saddle of the western cowboy, protect the beast from fractures of the spine, which would almost surely result from the violent jarrings and poundings these unwieldy carts impart as they jolt and jostle and knock about on the wretchedly blocked streets of the wholesale section. These great wooden saddles, a small load in themselves, are also mounted with glittering metal.

The four and five mule tandem teams of the bay district are interesting. Here, again, the greatest possible violence is done the physical conditions of the city. A five-mule tandem drawing one of the widest and heaviest carts demands the entire thoroughfare for the time being, and usually gets it. To attempt to pass it means to tangle the tandem together into an untangleable mass of hybrid, harness, driver and cart. There is nothing to do but to stop and allow it all the leeway it wants, or else turn about face, make for the nearest cross street and go around the square.

Though mules are used exclusively in the wholesale section of the city, in other parts there are ox teams deserving of description. Most of the oxen are low in stature and stockily built. They are generally well kept, always shod, and bear their yokes on their heads, as in Egypt and old Mexico. I have been told that it is the custom to leave the yoke on the span always. These are so securely thonged to the animal's head and horns that I can quite understand that it would be troublesome to remove them every night and replace them in the morning. But it appeals so strongly that it is an act of extreme cruelty to keep them yoked together by the heads for months or years at a time that it is difficult to believe that it can be true. Their vehicles are always the great cumbersome carts of the country. Enormous loads of stone, lumber, lime and other commodities are carried on these carts, and as the city's streets are rough and the country rolling, it can readily be imagined that the team has to steady the load by its horns over all kinds of surfaces and in going up hill and down. If the load was on a wagon it would not be so bad. With the weight thrown backward they are all but lifted in the air, while with it thrown forward, as in going down hill, almost the entire weight is upon their heads and horns.

Daily immense loads of lumber are to be seen being carted in this manner along the Prado and in other good residence sections of Havana. Now and then the lumber projects beyond the oxen's heads several feet and out beyond the cart as far. There is a good deal of skill shown in the loading, but, nevertheless, it seems like the acme of cruelty to jar and jostle and jolt these dumb brutes with a load weighing several tons, all of it being steadied and pulled by their heads.—*Chicago Record*.

FIDELITY is the sister of justice.—*Horace*.

BIKE WAGONS.

KEEPING abreast of the times, and as usual anticipating the wants of the trade, the Schubert Bros. Gear Co., Oneida, N. Y., are building a line of bike wagons in the white which are commanding atten-



BIKE WAGON IN THE WHITE.

tion everywhere. These wagons are attractive in design, well built of the best materials, and sell at sight to those who are judges of high class carriage construction. No. 700, which is here illustrated, is one of the most popular styles. The company are manufacturers of bodies and seats for automobiles and electric motor vehicles.

"THE MOTOR VEHICLE INDUSTRY."

THE above is the title of a pamphlet by W. A. Whittlesey, 626 Tremont Building, Boston, Mass. It is a compilation from various publications and current news, together with personal observation by the author. Little, if any, effort has been made to sift the matter, and as a consequence much that is ridiculous appears in its pages. This is perhaps a good feature, as the ridiculous is in a measure nullified by the really practical matter. The various articles in which efforts are made to prove the economic value of the motor over the horse are based upon mathematical calculations, so figured as to prove the writer's side of the question. The history of the motor vehicle is very incomplete, but the little there is will interest the reader. There is enough in it, however, to warrant it a place among the literary efforts in behalf of the motor vehicles of the day.

A NEW IDEA IN ELLIPTIC SPRINGS.

THE common saying that nothing more can be done to improve the elliptic spring has met its Waterloo. In Rome, N. Y., the Forsberg Spring & Axle Co. are making the new Forsberg rubber head spring, which is constructed on an entirely new principle—the eye not being welded on the spring, therefore retaining the flexibility of



the entire length of the spring. Experts who have investigated the Forsberg invention pronounce its practicability and say it is sure to be generally adopted. It has special advantages for use on automobiles. The Pell Gear Works, of Rome, N. Y., are the sole selling agents.

SOLDERS FOR GLASS.

It has been recently discovered, says an exchange, that an alloy composed of ninety-five parts of tin and five parts of zinc will melt at about 392° F. Becoming firmly adherent to the glass, it is unalterable, and exhibits an attractive luster. An alloy containing ninety parts of tin and ten parts of aluminum will melt at 500° F., and also forms a strong and brilliant solder for glass. With these two alloys always ready to hand glass may be soldered as easily as two pieces of metal. When the glass is heated in a furnace the soldering can be accomplished by rubbing the surface with a rod of either of the compositions named. The alloy as it flows can be evenly distributed with a soldering iron.

THE FIRST AUTOMOBILE STORE.

Editor of THE HUB:

APRIL 3, 1900.

DEAR SIR—Wednesday, April 4, Kenneth A. Skinner opened at 268 Massachusetts avenue the first automobile store of its kind in America.

In addition to his selling exclusively the product of De Dion Bouton & Co. in the United States, including motors, tricycles, quadricycles, vehicles and all necessary parts, he will do a renting, storage and repairing business with automobiles, and storage and repairing in the bicycle line. He will have competent instructors ready to give automobile lessons at reasonable rates, and to accompany ladies and gentlemen on automobile rides.

Wednesday afternoon Mr. Skinner extended an invitation to all who were interested in the twentieth century vehicle to visit his store and take a ride on one of the De Dion Co.'s latest creations, and his store was thronged with intending purchasers all through the day and until late at night. He bids fair to do an enormous business.

Yours truly,

C. S. HENSHAW.

268 Massachusetts avenue, Boston.

CIRCULAR LETTER.

ON March 3 our plant was destroyed by fire. We have at our disposal 110 tons of finished anvils. Part of this is our own stock at San Francisco, and the balance is several large stocks held by our customers, who have agreed to let us draw from them. In addition we have seventy-five tons of anvils in the course of completion. These are undamaged, and we will be ready to finish and ship them within three weeks. While we cannot furnish any special anvils short of six weeks, it is apparent that we will have no difficulty in supplying all urgent orders for regular goods. We hope, therefore, that you will continue to send us your orders, but only in such quantity as necessary to meet urgent demands. We shall lose no time in starting up, and when we do we will be in a better position than ever to serve you.

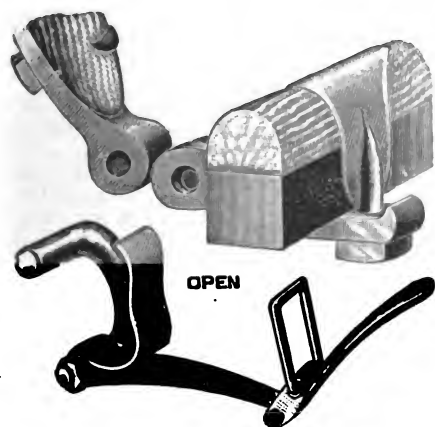
Thanking you for past favors, and hoping for your continued support, we are,

Yours very truly,

HAY-BUDDEN MANUFACTURING CO.

EMPIRE STATE SHAFT COUPLING.

THE demand for quick shifters and anti-rattlers in the carriage trade has led many men of an inventive turn of mind to strive to solve the problem. There are several good designs now being offered for sale, and they have proven both useful and practical. One of these inventions, which is for use with the ordinary shaft eye and axle clip, is being manufactured by the Empire State Shaft Coupling Co., Utica, N. Y. The illustration shows the "Empire State" in posi-



tion ready to be attached to the vehicle. It is simple and strong in construction, and use in regular service has proven it to be all that the manufacturers claim. A very important point is the hook on clip tie, which makes it impossible for the lever to become detached. These special clip ties are furnished free with every pair of anti-rattlers. This is the season of the year when specialties of this kind are springing into demand, and we feel that it would be good business policy on the part of our readers to write for full particulars concerning the "Empire State," without delay.

Most men are like eggs, too full of themselves to hold anything else.

Obituary.

VICTOR BERRY.

VICTOR BERRY, a well-known carriage dealer of Huntsville, Ala., aged fifty-five years, died on March 17 at his home on Mill street from pneumonia. Mr. Berry was born in Nelson County, Ky. He resided in Athens, Ala., several years, and removed to Huntsville ten years ago. He was known as an upright business man and had many friends.

GOTTLIEB DAIMLER.

GOTTLIEB DAIMLER, Counsellor of Commerce, the inventor and founder of the automobile industry, to the development of which he had devoted his entire energy, died at Cawnstadt, Germany, on March 6. His labors in the interest of this new means of transportation insure his lasting memory for all time.

JOHN AUGUSTUS ELMENDORF.

JOHN AUGUSTUS ELMENDORF, a descendant from the well-known Dutch family of that name, who were among the early settlers of the Hudson, died April 5, at his home, No. 68 West Fifty-first street, from a complication of diseases. He had long been an invalid, and during the last ten days had been seriously ill. He was born September 11, 1828, at Kingston, N. Y., and was the son of Levi and Saletye Meir Elmendorf. He began his mercantile career in this city in 1847, and when he died he was vice-president of the house of Edward Smith & Co., varnish manufacturers, of New York City. He was a member of the Holland Society and Sons of the Revolution, and at one time was a lieutenant in the Thirteenth Regiment. In 1855 he married Frances Catharine Richards. He leaves two children.

GEORGE SMITH.

GEORGE SMITH, aged seventy-two, a highly respected citizen of Beloit, Wis., died on March 20. He was a brother-in-law of Mrs. Potter Palmer, of Chicago, marrying Jane Palmer in 1854. He was a prominent carriage builder.

WESLEY A. THOMPSON.

WESLEY A. THOMPSON, a well known coach painter and designer, died recently in Philadelphia, aged forty-seven years. At the time of his death he was in the employ of Horace Erwine, Ogontz, Pa. Mr. Thompson had an especial talent for designing monograms, and at one time furnished THE HUB with 100 original designs, one of which contained every letter in the alphabet. Others had from two to ten letters. He was much respected by all who knew him. He leaves a widow.

RECENTLY EXPIRED PATENTS.

THE following list of recently expired patents is furnished by Messrs. Davis & Davis, successors to Alexander & Davis, solicitors of patents, Washington, D. C. A copy of any one of these may be had for 10 cents by sending to the above firm.

EXPIRED FEBRUARY 20, 1900.

- 272,420—Shifting-seat for Vehicles—Richard Fawcett, Salem, O.
- 272,492—Holdback for Vehicles—John H. Stamp, Mount Union, O.
- 272,543—Detachable Step for Farm-wagons—James Hallett, Hannibal, Mo., assignor of one-half to Daniel W. Morgan, Pittsfield, Ill.
- 272,555—Dumping-wagon—Charles Kaepfel, New York, N. Y.
- 272,557—Two-wheeled Vehicle—George P. Kimball, San Francisco, Cal.
- 272,571—Spoke-socket—Charles E. Merrifield, Indianapolis, Ind.
- 272,589—Top-prop Nut—Anson Searls, Newark, N. J.
- 272,594—Top-prop Nut—Henry Smith, New Haven, Conn.
- 272,628—Thill-coupling—Gaylord W. Beebe, Swanton, Vt.
- 272,678—Two-wheeled Vehicle—Joshua G. Gay, Ottawa, Ill.
- 272,691—Wheel Runner—Harold Holland, Lynn, Mass.
- 272,826—Apparatus for Tightening Tires—Peter Young and James Young, Monticello, Ia.

EXPIRED FEBRUARY 27, 1900.

- 272,908—Wagon-gearing—Thomas Seaman, Listowell, Ont., Canada.
- 272,922—Vehicle-spring—Morris V. Tucker, Sumner, Mich.
- 272,928—Two-wheeled Vehicle—Osborn Wilson, Aurora, Ill.
- 273,041—Rub-iron for Wagons—Peter Dickman, Defiance, O.
- 273,056—Vehicle-reach Coupling—Stephen E. Foster, Minneapolis, Minn.
- 273,147—Wheel-tire—John T. Prior, Prior's Station, Ga.
- 273,180—Carriage-apron—George S. Spare, New Haven, Conn.
- 273,242—Vehicle-spring—Wells M. Peck, Syracuse, N. Y., assignor of one-half to George Studer, same place.

NEW PATENTS RELATING TO CARRIAGES, ETC.

- 640,460—Non-puncturable Wheel-tire—Albert M. Ferguson, Syracuse, assignor to Rochester Non-Puncturable Tire Co., Rochester, N. Y.
- 640,664—Whiffletree Hook—Francis W. Key, Staunton, Ga.
- 640,699—Means for Supporting Frames or Bodies of Vehicles—Charles L. Merkel, Milwaukee, Wis.
- 640,219—Sand-band for Vehicles—John Obleins, Mentone, Ind.
- 640,231—Spoke Fastener—Boling M. Sadler, Burkville, Ala.
- 640,243—Stay Rod and Chain for Vehicles—Henry E. Warren, Morgan, Mo.
- 640,851—Tire for Wheels—Olaf J. M. Ancora, Milwaukee, Wis.
- 640,863—Elastic Tire—Edgar M. Birdsall, Buffalo, N. Y., assignor to D. H. Bothwell, Toledo, O.
- 640,737—Hub—Robert R. Boggs, Spring Run, Pa.
- 640,877—Vehicle Seat Fastener—John A. Coss and F. G. Parrshall, Phoenix Mills, N. Y.
- 640,883—Footboard for Vehicles—Herman Dhuse, Kendall, Ill.
- 640,891—Footboard for Vehicles—John W. Eisenhuth, assignor to M. G. Read, New York, N. Y.
- 640,895—Spoke-tenoning Machine—Frederich W. Forster, Burlington, Ia.
- 641,204—Gearing for Horseless Carriages—Emmet P. Gray, assignor of two-thirds to O. Armleder and Louis B. Swayer, Cincinnati, O.
- 640,788—Brake Shoe—John Medway, Chicago, Ill.
- 640,927—Shielded Rubber Tire for Vehicles—Robert Mitchell, Jr., Glasgow, Scotland.
- 640,931—Wagon-brake—George Newton, Odessa, N. Y.
- 641,146—Vehicle-brake—Aaron L. Parker, Philadelphia, assignor of one-half to Z. H. Kimbrough, Dixon, Miss.
- 641,043—Automobile—Peter J. A. Schnoor, assignor of one-half to H. Martensen, Holstein, Ia.
- 640,968—Electric Vehicle—Elmer A. Sperry, assignor to Cleveland Machine Screw Co., Cleveland, O.
- 641,355—Tire Tightener—John K. Adams, Tonkawa, Okla. Ter.
- 641,427—Wheel and Axle—Arthur M. Allen, New York, N. Y.
- 641,277—Wagon Brake—Benjamin I. Davis, assignor of one-half to J. C. Sullivan, C. P. Davis, and R. L. Wood, Booneville, Va.
- 641,511—Driving and Steering Mechanism for Motor Vehicles—Charles T. Hildebrand and F. R. McMullin, Chicago, Ill.
- 641,514—Motor Vehicle—Charles W. Hunt, New York, N. Y.
- 641,313—Motor Vehicle—Andrew J. Martin, Buffalo, N. Y.
- 641,314—Clutch for Motor Vehicles—Andrew J. Martin, Buffalo, N. Y.
- 641,390—Thill Coupling—Johnston Mealey, Howard Lake, Minn.
- 641,315—Dumping Wagon Box—George W. Merrill, Bay City, Mich.
- 641,603—Electrically-propelled Vehicle—Frederick J. Newman and J. Ledwinka, Chicago, Ill.
- 641,645—Hansom Cab—Lubin Paradis, Cambridge, and N. Desrosiers, Boston, Mass.
- 641,404—Motor Carriage—William E. Pearson, Boston, Mass.
- 641,412—System of Electric Circuits and Brakes for Vehicles—Elmer A. Sperry, Cleveland, O.
- 641,560—Anti-rattling Thill Coupling—John Sykes, Greensburg, Pa.
- 641,347—Wagon Standard—Rector M. Thompson, Brumley, Mo.
- 641,834—Combined Driving and Steering Axle for Automobile Vehicles—James H. Bullard, Springfield, Mass.
- 641,764—Rubber-tire Machine—Samuel W. Collins, Indianapolis, Ind., assignor to Rubber Tire Wheel Co., Springfield, Mass.
- 641,944—Thill Coupling—William H. Edwards, Hillsborough, Ind.
- 641,945—Vehicle Gear—George W. Farrell, assignor to A. Farrell, Au Sable Forks, A. W. Shields, and B. B. Mason, Keesville, N. Y.
- 641,850—Carriage Wheel Oiler—Peter H. Fishell, assignor of one-half to G. L. Snyder, Marion, Ia.
- 641,768—Apparatus for Setting Rubber Tires—Arthur W. Grant, assignor to Rubber Tire Wheel Co., Springfield, O.
- 641,693—Heating Device for Sleighs, etc.—Peter Hack, Michigan City, Ind.
- 641,771—Wagon Running Gear—Stephen M. Harris, Cheney, Wash.
- 641,963—Thill Coupling—Nathan Horning, assignor of three-fourths to C. B. Knox, Johnstown, N. Y.
- 641,964—Thill Coupling—Nathan Horning, assignor of three-fourths to C. B. Knox, Johnstown, N. Y.
- 641,786—Vehicle Spring—Herbert C. Martell, Columbus, O.
- 641,881—Hub for Vehicle Wheels—James H. O'Brien, St. Louis, Mo.
- 641,735—Tire for Vehicle Wheels—Henry W. Theis, assignor of two-thirds to G. Podoll and G. H. Gottschalk, Milwaukee, Wis.
- 641,736—Vehicle Wheel—William F. Thomas, Burlington, Ia.
- 642,020—Vehicle Brake—Robert Tucker, Newcastle, and F. Boyling, Sydney, New South Wales.
- 642,022—Wheel Hub—Francis J. Viel, Blossburg, Pa.
- 642,192—Thill Coupling—Timothy G. Aldrich, Denver, Col.
- 642,513—Rubber Tire for Vehicle Wheels—Frank H. Bolte, assignor to Peoria Rubber & Manufacturing Co., Peoria, Ill.
- 642,293—Device for Tightening Wheel Rims—Lemuel Buis, Little Rock, Ark.
- 642,089—Tire—Abednego Dewes and H. A. Whiting, New York, N. Y.

Copies of above patents may be obtained for 10 cents each by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

Trade News.

BY UNCLE SAM.

ALABAMA.

DEMOPOLIS—The McKinley Wagon Works are now at work regularly and turning out wagons at the rate of two a day. Manager Edwin McKinley says the demand on them by the trade is greater than they can meet. It is understood the plant will be enlarged.

CALIFORNIA.

RIVERSIDE—John Miller has leased the storeroom formerly occupied by the Piper hardware store, and he is having it fitted up with a view to opening therein a first-class stock of harness, carriages, farm machinery and hardware.

CONNECTICUT.

MIDDLETOWN—A joint stock company, to be known as the W. H. Smith Co., has been formed, and the following directors elected: Mayor F. P. Burr, A. B. Calef, Jr., William H. Smith, Walter H. Smith, of Middletown, and D. M. Holmes, of Old Saybrook. It is the purpose of the company to conduct a carriage repository and livery business on Rapello avenue. After the meeting of the directors, the following officers were elected: President, A. B. Calef, Jr.; secretary and treasurer, William H. Smith.

NEW HAVEN—Wooster P. Ensign, who succeeded the firm of Wooster A. Ensign & Son, dealers in carriage hardware, filed a petition in bankruptcy in the United States Court on March 20. The petition was sent to Hartford and will be referred to Referee Newton. The schedule accompanying the petition shows that the liabilities are \$10,687.15 and the assets \$10,373.65. The petitioner is the son of the late Wooster A. Ensign, and was associated for several years with his father in the business on Orange street. After the death of the father Wooster P. Ensign established an iron and steel business on Commerce street, at the corner of Water street. He occupied the old Derby Depot and conducted a wholesale business.

Page's carriage factory on Franklin street started in on a ten hour schedule on March 12. The factory has been running eight and nine hours for some time.

FLORIDA.

JACKSONVILLE—The carriage factory of McMurray & Baker was destroyed by fire on March 2. Loss on stock, about \$20,000; fully insured.

IOWA.

BURLINGTON—The Orchard City Wagon Co. has filed articles of incorporation. It has \$100,000 capital, and is incorporated by J. H. Hertzler, A. F. Hertzler and John Zaiser.

DES MOINES—H. Lagerquest, one of the oldest and best known carriage men in Des Moines, who has conducted a repair and special order shop at 313-315 West Second street, has completed the organization of the Lagerquest Carriage Co., which will engage in the manufacture of carriages for the trade in this city as soon as a new factory building contracted for can be completed and the machinery installed. Mr. Lagerquest will have most of the stock in the company, but some others will be associated with him. The company will have ample capital to carry on the business. A new building will be erected on Grand avenue, just north of the central fire station and west about 60 feet from the corner of West Second street. It will be a three-story brick building, with a frontage of 50 feet on Grand avenue, and will run back about 100 feet from the street. A cement basement for stock room purposes, engine and boiler rooms, etc., will be built under the entire building, and the three upper floors will be devoted to manufacturing business. All but a small portion of the building will be used for the carriage factory. This space is to be devoted to the manufacture of a rubber horseshoe patented by Mr. Lagerquest.

ILLINOIS.

BRADLEY—The Bradley Buggy Co. has been incorporated. Capital, \$50,000.

CHICAGO—A gas engine in the basement of the wagon factory of Jacob Press' Sons, 62 and 64 North Halsted street, exploded on March 3, and \$1,200 damage was done to the building and contents by the fire which resulted. The loss on the building was \$600 and on the contents \$600.

The Wright & Lawther Linseed Oil Works, belonging to the American Linseed Oil Co., at Ellsworth and Polk streets, were partially destroyed by fire on March 6. The loss on the mill will not reach over \$25,000, as the machinery in it was not expensive. The company was protected by insurance.

INDIANA.

ELKHART—The Elkhart Carriage & Harness Manufacturing Co. has just issued its twenty-seventh annual prospectus and price list, a compact volume of 144 pages, in which are set out the schedule of prices and illustrations of the various vehicles and classes of harness manufactured by the company.

MARTINSVILLE—Walls & Elmore have sold their buggy business to L. A. Dobbs. They retain the harness business. Walls & Elmore made the sale in order to permit them to branch out more extensively into the wholesale harness business.

MAINE.

WATERVILLE—The building on Silver street next to the store of Redington & Co., is being fitted up by C. H. Vigue, who will soon start in the carriage business there.

MARYLAND.

BALTIMORE—Charles W. Heuisler and John M. Heighe were on March 9 appointed receivers to take charge of the business of William Bowers & Son, carriage manufacturers at 516 and 518 West Baltimore street, upon the filing of a bond for \$9,000. John E. Bowers filed the bill against William T. Bowers, who consented to the appointment of receivers. It was claimed that the business was so involved that it was necessary to dispose of the effects so that the creditors could be paid and satisfied. The defendant agreed to the appointment of receivers, and declares that the assets are sufficient to pay all the creditors in full and leave a surplus.

MASSACHUSETTS.

BOSTON—The carriage factory of J. P. & W. H. Emond, Roxbury district, was partially destroyed by fire on February 9. Loss, \$5,000.

FRAMINGHAM—Osburne & Flett, the well-known carriage makers and dealers, who bought the Crandall repository on Irving street, are rushed with orders, and their business is increasing every day.

PITTSFIELD—E. P. Ryan has opened a carriage paint shop in one of the vacant stores in the Hotel Burbank Block, West street.

KENTUCKY.

LOUISVILLE—The Kentucky Wagon Manufacturing Co. is now sending out checks on the First National Bank, in payment of the regular quarterly dividend of 2 per cent., declared on February 14.

Among the new companies doing business in Louisville is the Standard Carriage Co., at Brook and Main streets. The stock is chiefly owned by out of town men, and employment will be given to a number of men.

OWENSBORO—Articles of incorporation of the Owensboro Buggy Co. have been filed. The capital stock is \$50,000, one-half of which has been subscribed. Work on the buildings will begin at once. The plant will have a capacity of 10,000 vehicles a year.

This city is to have another carriage factory in operation at an early date. Dr. J. H. Hickman and W. A. Steele will be the principal stockholders of the corporation. Work on the building, a large three-story brick structure, will begin as soon as the weather opens up, and it is expected to have the plant in operation in ninety days from that date.

MICHIGAN.

FLINT—The Flint Wagon Works were partially destroyed by fire on March 20, one of the large buildings being burned. Mr. Tuttle, of that company, says: "The fire was in the department for making farm and lumber wagons and machinery, and did not affect any other part of our plant. The damaged part will be rebuilt at once, and the men who are thrown out of regular employment by the fire will be at work at something else until our department is ready to resume business. We will be able to supply the retailers with everything in the line of light goods. Our jobbers out west will have to wait a while, and we will be delayed somewhat on the farm wagons. We employ 500 men, and about one-third of them have been affected by the fire."

JACKSON—The carriage body manufacturing plant of the Avery Manufacturing Co. has been sold on chattel mortgage by the Smith & Winchester Hardware Co., of Jackson, and Young & Lesh, of Adrian, for \$5,000.

WAYNE—The fire which destroyed the Sells wagon shop is now believed to have been the work of incendiaries.

MISSOURI.

MARYVILLE—Frank Barmann has sold out his shoe store, and will devote his time to his buggy business.

NEW YORK.

ALBANY—Assemblyman Apgar's bill prohibiting the operation of a motor carriage or vehicle on a highway without a \$2 license was reported favorably by the Assembly Judiciary Committee on March 21. The Board of Supervisors is authorized to appoint a person to inspect such vehicles.

BOLIVAR—A quarrel over some business matters led to a shocking double tragedy at Bolivar on March 1, which resulted in the death of Bert Wixson, aged twenty-seven years, and Edward Mead, aged twenty-three years. The two young men have been in partnership conducting a carriage shop for the past two years.

ISLIP—The Bay Shore Carriage & Automobile Co. is erecting a paint shop and blacksmith shop at their factory, corner of Second avenue and Brook street.

KINGSTON—William H. Nock, a wagonmaker of Kingston, has filed a petition in bankruptcy, with liabilities of \$3,806 and no assets.

NEW YORK CITY—The Mutual Wagon & Carriage Co., at Hudson street and Eighth avenue, showed a procession of business wagons, fresh from the hands of the workmen, moving to purchasers in a score of places in New York and surrounding towns.

"That is the sort of sale that gladdens the auctioneer's heart," said Mr. Kearney, of Van Tassell & Kearney, "and while it has been going on we have been busy upstairs with private sales. Runabouts, surreys, fancy traps and speeding wagons are the particular favorites just now, while the spring fever is working in the circulation of buyers. We have laid in a fine stock of second hand vehicles that are something like the proverbial 'hot cakes.' They are modern styles, and embrace broughams, victorias, phaetons, wagonettes and traps, made by the best known manufacturers."

F. V. Carlough, of the New York Wagon Co., Eighth avenue and Thirteenth street, reports a boom in delivery wagons, which continues with an order this week from a metropolitan department store for five of the latest improvements in these vehicles. "Demand for pneumatic goods is on the rapid increase," he says.

In February a judgment was obtained by William F. Grant against the Pratt & Lambert Co., varnish manufacturers, for \$27,040, for balance due on contract price for formula for the manufacture of the "Faultless" varnish.

Recent days have been busy ones at Edward Callanan's Sons, No. 57 West Forty-fourth street, where the full force has been at work putting second hand vehicles in repair for the market, and hurrying up to be ready for the repair orders that always pour in during March.

The old carriage house of William H. Gray, at No. 61 Wooster street, has been moving things about, getting the heavy closed winter stock into the background to make room for the now more seasonable goods, and has conspicuous the lighter open vehicles that suggest spring and summer on wheels. In finish and coloring these vehicles come out in the latest accepted modes.

ONEIDA—William F. Schubert and Merton R. Siver have formed a co-partnership, purchasing the Upson & Holden shops in Cedar street, and will engage in the manufacture of wagons and sleighs, and do general jobbing, under the firm name of Schubert & Siver. For nearly thirty years the business was conducted by Miles Upson and Henry Holden, but that well-known firm was dissolved some time ago by the death of the junior partner. The senior partner of the new firm was at one time identified with the Schubert brothers, but more recently has been dealing in carriages in Phelps street. Mr. Siver is now in Chicago.

WATERTOWN—At the Union Carriage & Gear Co.'s shops on Newell street a prosperous condition of affairs is found. The shop opened with the beginning of the present year, and has been fitted up with new machinery throughout and is now in complete running order. The business is large, the number of orders exceeding by a pleasing margin those of last year. The company is making a specialty of a light two seated pneumatic surrey, which they claim to be the lightest four passenger pneumatic on the market to-day. A force of ninety men is kept working full time.

WEST BRIGHTON—Fire destroyed the carriage factory of Richard Lemmer & Co., at Columbia street and Carey avenue, West Brighton, recently. The fire spread to three other buildings a short distance away, and one of them was partly destroyed. The total loss is estimated at \$18,000; partly covered by insurance.

NEW HAMPSHIRE.

MANCHESTER—James Murphy will open a new carriage paint shop in the building formerly occupied by Eastman's carriage repository in West Manchester. Mr. Murphy will continue to run his shop in East Manchester, but not having room enough there, will open the other shop in order to accommodate his patrons.

NEW JERSEY.

FLEMINGTON—Charles W. Burd has purchased a lot on New street, and will erect a carriage repository.

OHIO.

CINCINNATI—A new carriage factory has been established in Cincinnati, and will soon be in operation. The concern is the Hickory Carriage Co. James R. Anderson is manager, and associated with him are Harry Pfeiffer and others, it being understood that Henry Burkhold is also in on the financial end. Mr. Anderson is a practical man of experience in the line he undertakes, and was heretofore of the Anderson & Harris Carriage Co. The capital of the concern is about \$25,000, and it will have a capacity for turning out about 4,000 vehicles. The plant is located on Gest street, between Mill Creek and the C., H. & D. Railroad.

FINDLAY—H. Corwin and J. W. Corbin have formed a partnership for the sale of buggies, carriages, wagons, etc. They will open a store in the Corwin Block, on the Court House Square.

PIQUA—Articles of incorporation have been issued the King Manufacturing Co. by the Secretary of State. The capital stock is \$10,000. They will manufacture and place on the market the King buggy top brake, the invention of J. H. King.

ROCK CREEK—O. A. Hoyt, a former resident of Rock Creek, has moon buggy washers. The invention is said to be fully patented a building in that town for the manufacture of his half-

tected by patent. It is expected that the new industry will give employment to five or six persons at the start.

SALEM—A. M. Carr & Son and Joseph T. Smith have formed a partnership for the purpose of handling buggies, surreys, road wagons and other wheeled vehicles. The large storeroom in the new Elks Block has been leased by the company, and will be opened about April 2. A full line of the best makes in the country will be carried.

PENNSYLVANIA.

ALVEDIA—John Englehart's carriage factory was damaged by fire on March 18.

PITTSBURG—A bill in equity was filed in Common Pleas Court No. 2 on March 2, against the Keystone Axle Co., by David A. Clark, who asks for the appointment of a receiver for the company, and for an injunction to restrain the directors from encumbering the property of the company with any further liability. No order has yet been made.

PHILADELPHIA—A. Wolfington & Son have remodeled their buildings on Twentieth street, and now have a beautiful repository, with plenty of light and a good-sized frontage. They are builders of both light and heavy carriages, and do a good business. They run a steam engine and are well equipped with labor saving devices. Mr. Wolfington, Sr., makes a trip down east about once a year, and thereby keeps himself well informed as to new designs in carriages and iron work. He has three sons in the shop, the eldest of whom was taken into the firm several years ago. They are all industrious, and take a deep interest in the business.

DOYLESTOWN—The Doylestown Agricultural Implement Works have been sold to the Winslow Motor Carriage Co., of Philadelphia, and motor wagons will be made in Doylestown.

WASHINGTON—The building on East Wheeling street, in which for many years A. T. McClure has conducted a carriage repository, has been leased by H. N. Thomas, who will conduct a similar establishment. Mr. Thomas is well known all over the country for his connection with the buggy and carriage business, and his exhibits at the Washington fair and other fairs throughout the county have always been up to date, and have drawn much attention. Mr. Thomas expects to be ready for business at his new stand by Saturday, April 7.

Hugh Wallace, of Taylorstown, is erecting a building 24 x 40 feet in size, which he will use as a repository.

RHODE ISLAND.

WESTERLY—The Stillman Carriage Co., of the West Side, has made arrangements whereby solid rubber tires are now put on at the shop, thus avoiding the delay of sending the wheels to a larger town. The establishment furnishes employment for nine men during the winter months, extra help being put on during the rush of summer work.

TENNESSEE.

BRISTOL—The wholesale firms of Bacon & Hamilton and W. R. Hamilton have consolidated, and will do a large business in farming machinery, vehicles and produce.

CHATTANOOGA—Among Chattanooga's new industries is the wagon factory of the Chattanooga Transfer Co. The latter company has embarked in this business on quite an extensive scale at their headquarters on Market street, and for the present are manufacturing wagons for their own use. The company has heretofore been employing others to make their wagons, but now that they have succeeded in turning out two wagons they conceive to be the best they have ever had, they will probably continue manufacturing vehicles for their own use.

LYNNVILLE—Regan Bros., who recently moved to this place from Marshall County, for the purpose of conducting a carriage and buggy manufactory, have begun work on their shops. They have bought of the administrator of T. H. Browning the tools of the Pulaski Carriage Works.

NASHVILLE—The wagon shop of Walley & McKinley, in the rear of 219 South Cherry street, was almost totally destroyed by fire on March 18. The loss will probably not exceed \$1,000. How the fire originated is a mystery.

VERMONT.

PLAINVILLE—D. W. Mason, the well-known carriage maker and general jobber, who has been engaged in that business in Plainville during the past thirty-three years, has adopted broader business plans. He has decided to enter into a business that will combine painting of buildings as well as carriages.

WEST VIRGINIA.

WHEELING—The wagon manufacturing shop of J. C. Beckett & Co., on Eighteenth street, has been improved and very much enlarged in the past few days, and the result is a considerable increase to the manufacturing facilities of the place. Trade is good.

John Beckett has purchased the entire interest of August Brune in the wagon-making business conducted by them, and the former will continue the business, which has been moved to the building on Eighteenth street recently occupied by the Wheeling Boiler Works.

Wants.

Help and situations wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word.

SITUATIONS WANTED.

I would like a position in an automobile factory. Have had some mechanical experience. Address "INDUSTRIOUS," care of THE HUB.

Position as foreman by first-class carriage trimmer. Fifteen years' experience at trimming, and four years as foreman. Strictly reliable and steady. Address "RELIABLE," care of THE HUB.

A first-class painter, letterer, stripper, ornament, gilder and finisher, quick, sober and capable of taking charge of general custom shop, is open for position May 1. Eleven years with one firm. References. Investigation solicited. Address F. E. MILLER, 34 East Third street, Peru, Ind. After May 1, 20 Burnett street, Hamilton, O.

Situation by a man with experience in the carriage business. Three years as superintendent and buyer for a concern building 2,000 jobs a year. Address, BOX 39, Linden, Mich.

An experienced and successful carriage salesman (single), who is now employed by one of the leading wholesale manufacturers of high-grade work, desires to change. His present territory is New York and the Eastern States, where he is in very close touch with the large dealers. References given. Address, WHOLESALE, care of THE HUB.

HELP WANTED.

A good man to take position as painter or trimmer, to work at either or both. D. T., care of THE HUB.

A first-class carriage trimmer for heavy and light work. Would prefer a young unmarried man. Address, with references, stating salary expected, R. E. K. B., care of THE HUB.

A first-class foreman for carriage factory working at present about fifty men, building the best grade of work only—fine business wagons and heavy carriages. Would prefer a young man who is not married. Address, stating experience, references, salary expected, etc., R. E. K. A., care of THE HUB.

Wanted—Hustlers to secure new subscribers for THE HUB. A good chance to make money easily. Subscription price \$2.00 a year. Liberal commission paid. Address, Subscription Department, THE HUB, 24-26 Murray street, New York.

MATERIALS WANTED.

Wanted—One second hand Elliot Dash Stitching Machine, large size, in good condition. Address, L. S. DOW, 416 Indiana Trust Building, Indianapolis, Ind.

PATENTS—H. W. T. Jenner, patent attorney and mechanical expert, 608 F street, Washington, D. C. Established 1883. I make an examination free of charge, and report if a patent can be had and exactly how much it will cost. Send for circular.

FOR SALE.

Two second hand spoke lathes in good condition. Address, L., care of THE HUB.

The large and well established Jacob Rummell wagon and carriage factory at New Castle, Pa. Is centrally located. In operation about thirty-five years. Two story brick, 48 by 80 feet, lot 60 by 160. Owner has realized well in the business, and wishes to retire. A money making investment. Address, J. W. STRITMATER, Jackson Block, New Castle, Pa.

Hardware business, established thirty-five years, and in perfect running order. Located in New York State city of 50,000 inhabitants. Excellent railroad center, low freight rates, best shipping facilities. Established trade with leading builders, manufacturers, blacksmiths, country merchants, and a good reliable retail trade. Stock approximately \$25,000, including fixtures. Can reduce quickly to \$12,000. Inspection invited. GRISWOLD, MALONEY & CO., owners, Elmira, N. Y.

A well equipped carriage shop and repository, with other property, employing 10 or 12 hands, doing profitable business. Only shop in a city of 25,000. Easy access to supply stores. A good opportunity for the right man with \$6,000. Full amount not absolutely necessary. Sickness and death of member of family reason for desired change. Address, D. P. C., care of THE HUB.

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An established automobile company with \$200,000 worth of orders in sight, is desirous of combining with a large carriage or wagon factory, to manufacture in quantities. Large profits assured. Unexceptionable references given and required. Address, "AUTOMOBILES," care of THE HUB.

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No. 27.—The Man Behind The Gun.

Of course you must have the gun; and a marvel of a gun it is—a marvel of science—on a modern battle-ship. The kind of gun, on the kind of ship that our grandfathers went to battle with, would invite massacre.

A modern Color-factory is as completely scientific as a modern navy. The old sailing vessel, with its primitive armament, was about as good as any other than the latest and best applications for color making.

We have a modern factory. Our machines are new—with every improvement—the best that can be made; but, like battle-ships, they cannot run themselves. Some machines do some kinds of work automatically—need only a child to push a lever; but a color-grinding machine is not of that sort. The more perfect its mechanism, the more knowledge and skill are required for its handling. It may be doing the ideal business at nine o'clock, and spoiling the batch at ten.

The man behind a color machine must know it, as the engineer knows his engine; must know the materials he feeds into it, as a chemist knows how his chemicals will act in the retort; must be able to detect the slightest variance in its working, as Ole Bull could sense the hair's breadth of slack in a violin string; must have the genius to remedy a fault, as the electrician has for his dynamo.

We have modern men behind our modern machines. All else in color-making is vain, if they fail. We spare no money and no pains to make the grinding PERFECT.

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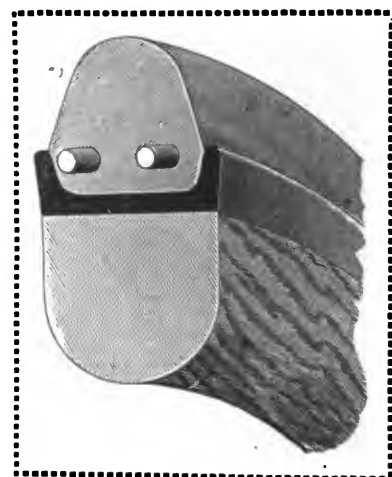
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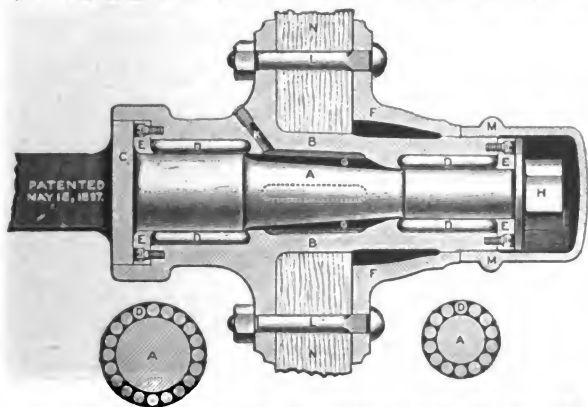
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The most perfect roller bearing; reduces draft fifty per cent.
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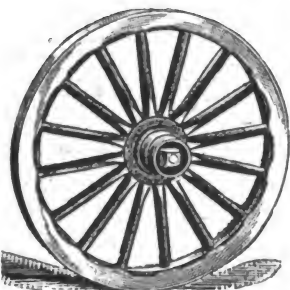
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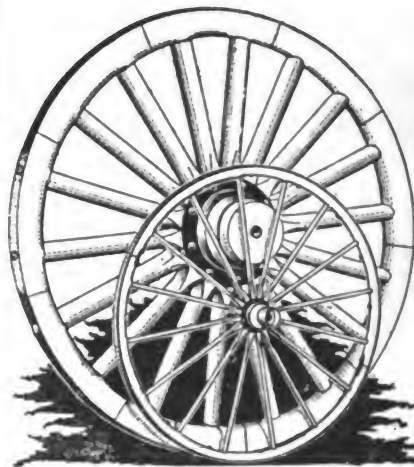
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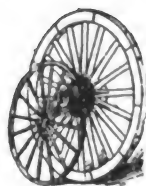
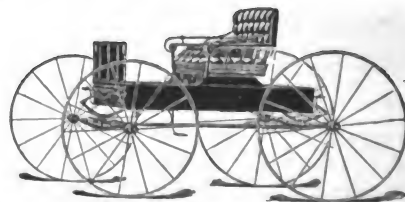
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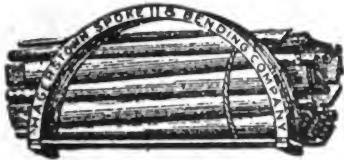
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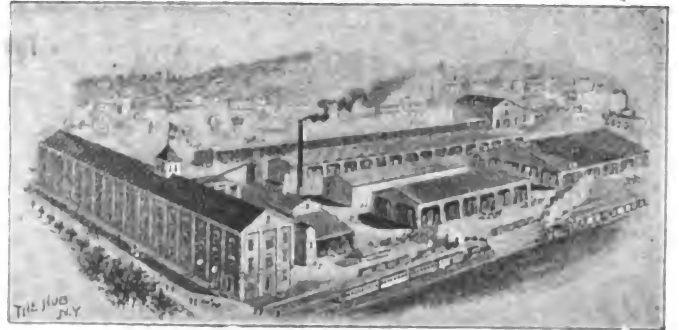
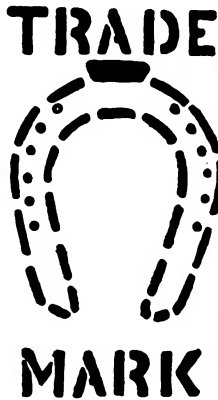
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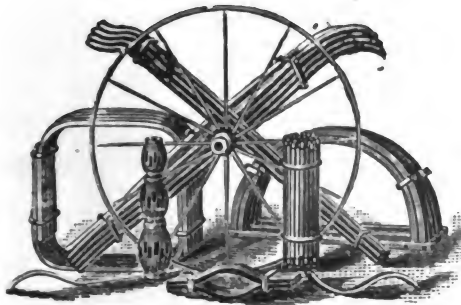
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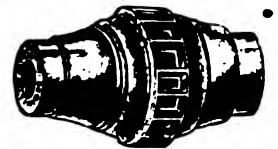
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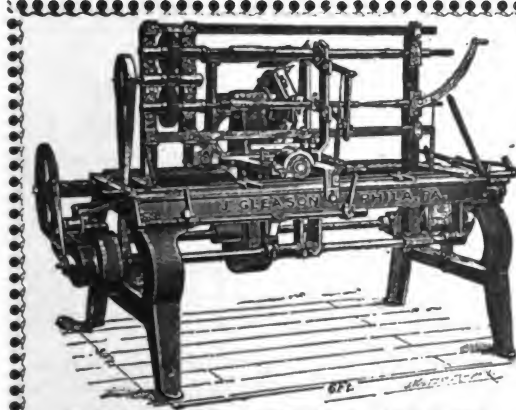
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Knives for all the different Gleason Machines
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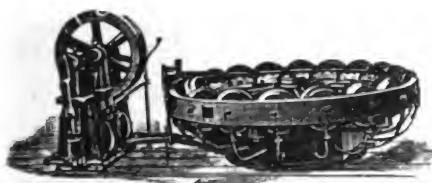
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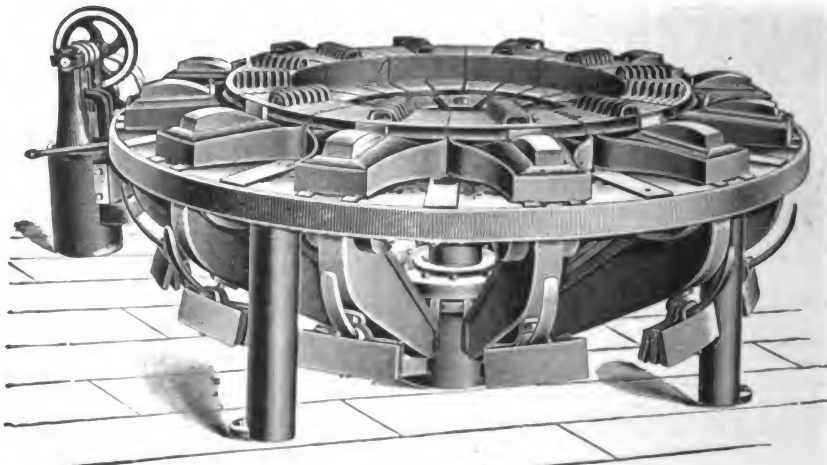
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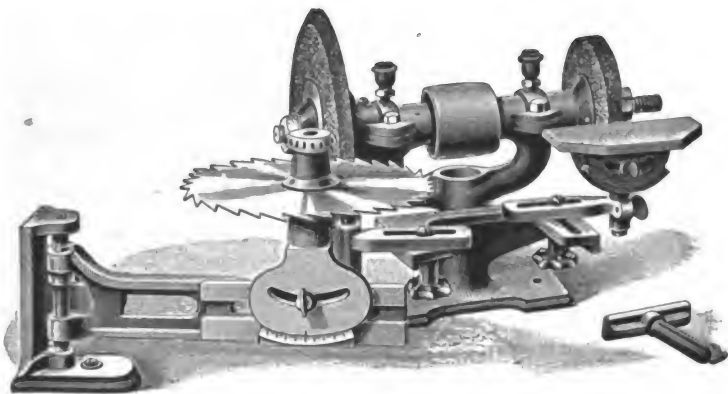
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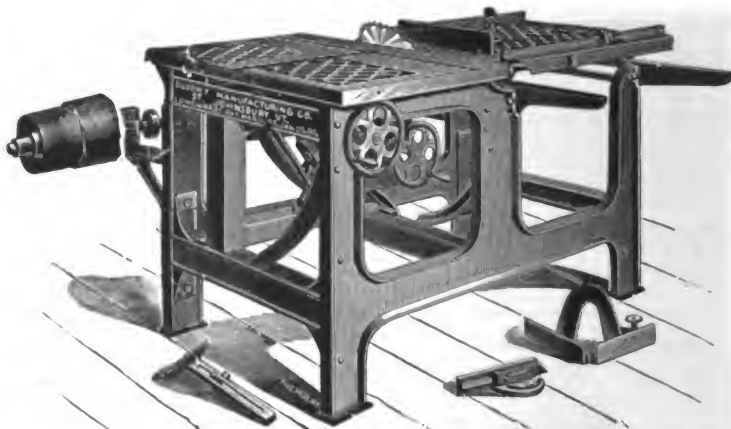


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Saw Sharpening Machine.

**Also Adapted for Grinding
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This machine is designed to sharpen saws with emery wheels instead of files, and if properly used saves a large amount of time, keeping the saws in perfect condition.



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THE HOWARD will saw accurately any angle, bevel or miter, or two angles at once, by means of raising and lowering one end of arbor, which may be adjusted to any angle up to 45 degrees.

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Every effort has been made in constructing this Hammer to make all parts of such proportions as to insure durability. The simplicity of its design leaves few parts to break. The workmanship is the best that can be obtained, and no pains or expense are spared to have the work done in the best possible manner. The material used in the construction of these Hammers is the best that can be obtained. The ram or Hammerhead, together with the links, side-arms, sleeve and connection, is of wrought iron. The crank and joint pins are of forged steel, and the castings for other parts the best to be had—every piece used in the construction of the Hammer being iron or steel, except the bronze bushing in the crank connection.

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DUPONT MANUFACTURING CO.

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The Hub

51

COOPER'S

"OLD RELIABLE"

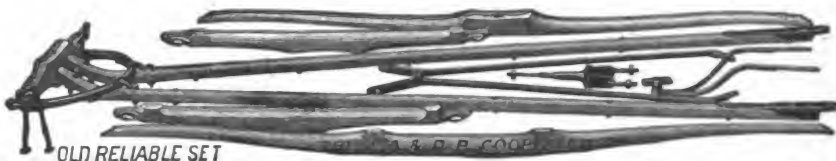
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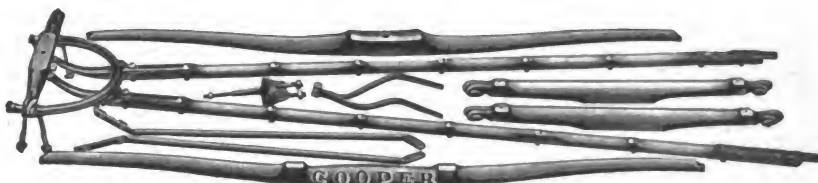
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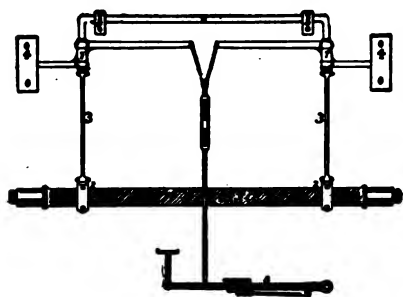
No. 70.—Set F, 12 x 11-16 in. Circle, $\frac{3}{4}$ x $\frac{1}{2}$ Reaches, No. 2 King Bolt, all wrought.



No. 80.—Set H, Two Passenger, $\frac{3}{4}$ x $\frac{1}{2}$ Reaches, Malleable Circles.

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Ferrel's Improved Brake



is the only safe and reliable brake. Will not rack, strain the springs or crowd the body forward. The lock always follows the axle, no matter how much the springs settle or lengthen. Will lock as well loaded as unloaded. Quick in action, and the most powerful lock on the market. Made for

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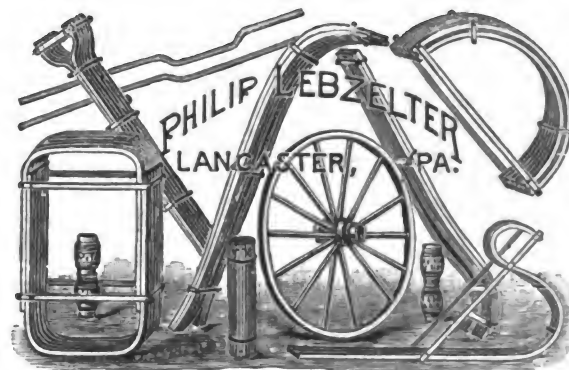
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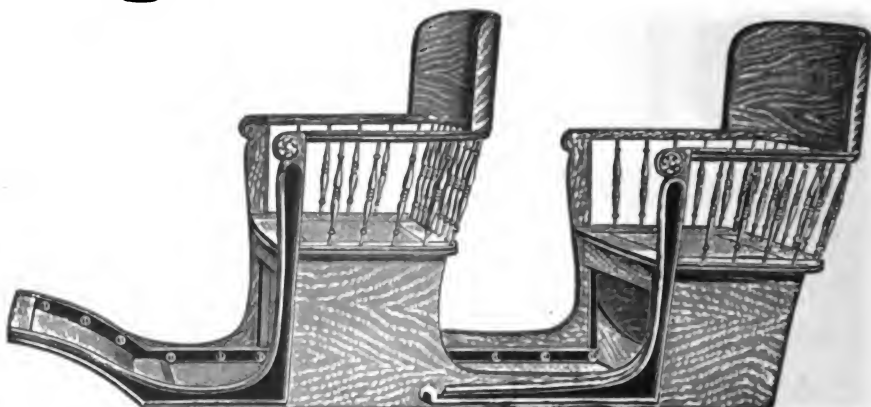
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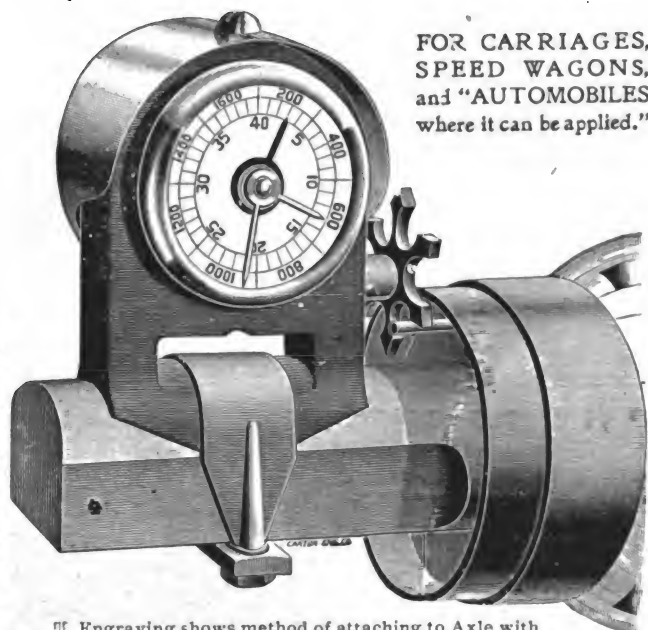
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The Engraving shows method of attaching to Axle with pin in Hub. A polished nickel shield protects the instrument from mud.

Registers the distance traveled, rings a small bell as each mile is passed, keeps a record for 1,600 miles, and repeats.

HANDSOME. ACCURATE. DURABLE.

Price, with Bell Attachment, Complete, by Mail, \$ 5.00
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Is always what a first-class body should be, and one body is like the other. Made of carefully selected materials and by good mechanics, **THEY ARE AS GOOD AS THEY LOOK ALL THE WAY THROUGH.**



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Send for our New Hanger, showing the latest styles for 1900. We are always pleased to make quotations.



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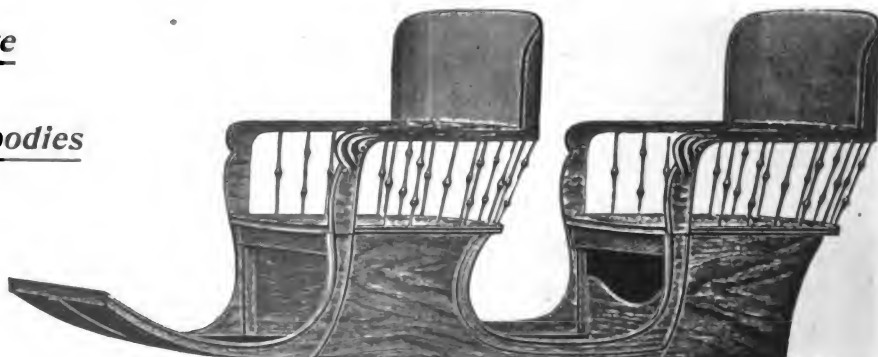
Many new and attractive
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A choice lot of stylish bodies
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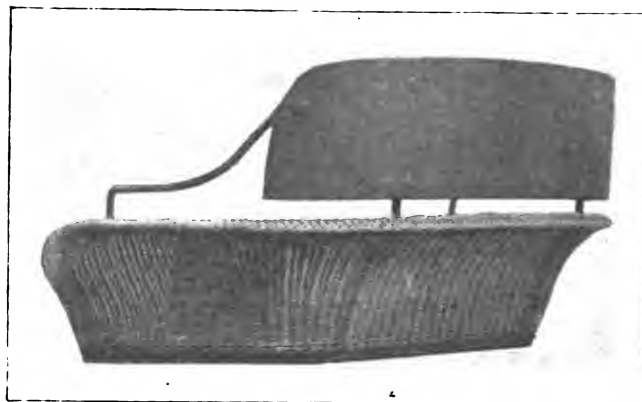
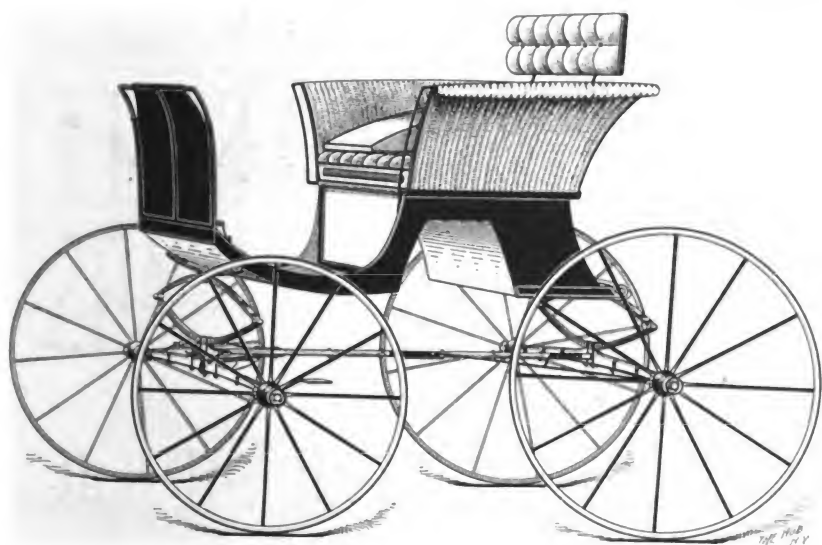
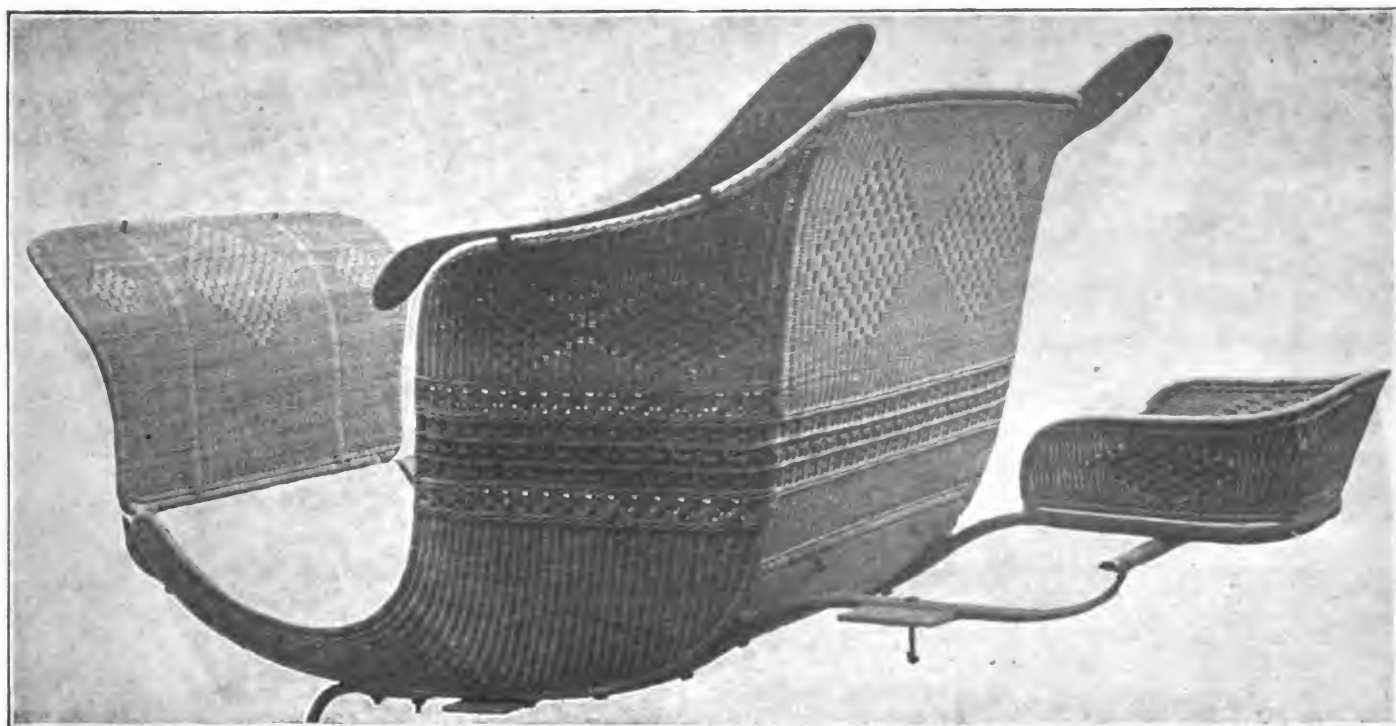
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We are giving particular attention to the designing and manufacture of this work. Write us for prices, also information about construction of iron frames.



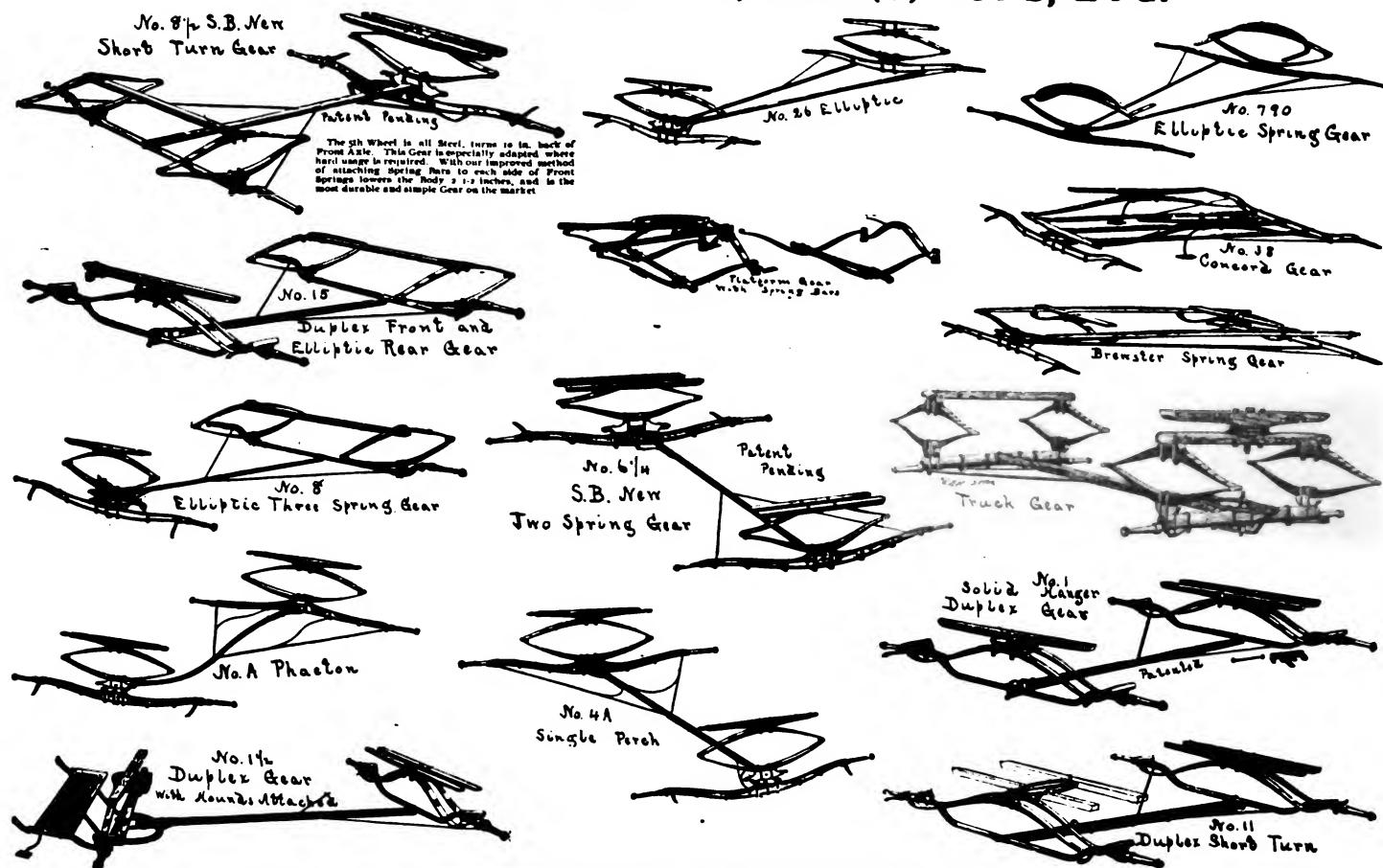
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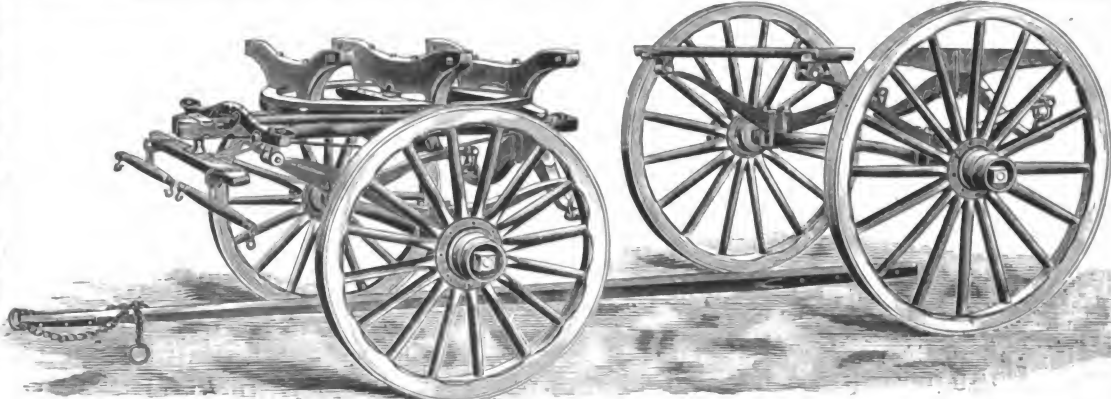
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THE SELLE GEAR CO.
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Complete Gears as shown above ready to receive body, for light and heavy work, can be furnished promptly. In ordering give full specifications, or such description as will enable us to make up specifications. Dealers in wagon materials will quote prices on our gears.

THE MATHER "Thousand Mile" Axle.



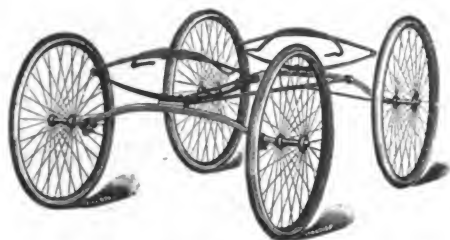
Will run 1,000 miles with one oiling.
 Prevents caudation of oil at ends.
 Positively dirt and dust proof
 No dirty, greasy hubs or nuts when this axle is used.
 No clumsy cap nut necessary to keep oil in.
 Cuts away less of hub than any other axle.

Cannot get out of order. Simplicity itself.
 This axle is patented, and the name "Thousand Mile" copyrighted, and can be used only in connection with the Mather "Thousand Mile" Axle.
 Beware of substitutes.
 Made exclusively by the

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Fitch Pneumatic Gear.

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WE MAKE BIKE GEARS AND WAGONS
IN THE WHITE, WITH WOOD HUB
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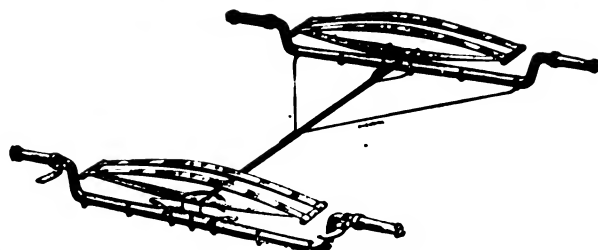
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Three-Spring Gear. Double Elliptic.

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Patented Feb. 16, 1897.

Double Elliptic End-Spring Drop Axle Gear.

Manufactured Solely by

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Fitch's Improved Combination Short-Turn Duplex and Elliptic Gear.

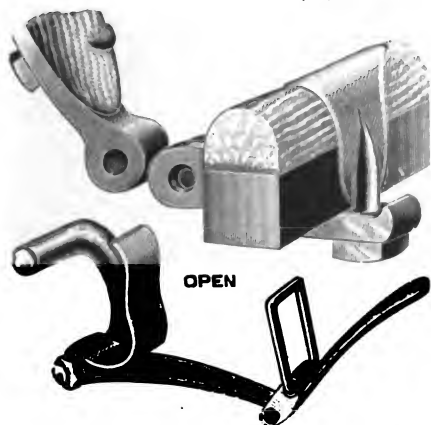
EMPIRE STATE SHAFT COUPLING,

QUICK SHIFTER AND ANTI-RATTLER.

JUST WHAT YOU WANT.

SAFETY COMBINED WITH UTILITY,
RAPIDITY and SIMPLICITY.

PATENTED MARCH, 1899.



OPEN

The Safest, the Strongest, the Neatest
and the Best Quick Shifting Coupler and
Anti-Rattler ever offered on the market,
for the following reasons:



CLOSED

1. BECAUSE it is used with common draw shackles.
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3. BECAUSE it has the strongest steel bolt, being one continuous piece, holding the shaft eye and spring with riveted nut.
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5. BECAUSE the lever curves upward, avoiding all possibility of catching obstructions.
6. BECAUSE all parts are made of the Best Materials, Thoroughly Tested and Guaranteed.

It is not claimed to be the cheapest Coupler and Anti-Rattler on the market, but it IS the cheapest when Safety, Reliability and Durability are taken into consideration.

It cannot come loose. See the hook on clip tie. Clip ties are furnished free with every pair of the Empire State Anti-Rattler. Made in buggy and surrey sizes. Special prices to jobbers and large manufacturers. Write for quotations at once, as the "Empire State" would prove a strong selling point for your vehicles.

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ONLY DIRECT WATER ROUTE
Between NEW YORK and

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Excellent Service, Fast
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To sound industries, substantial inducements
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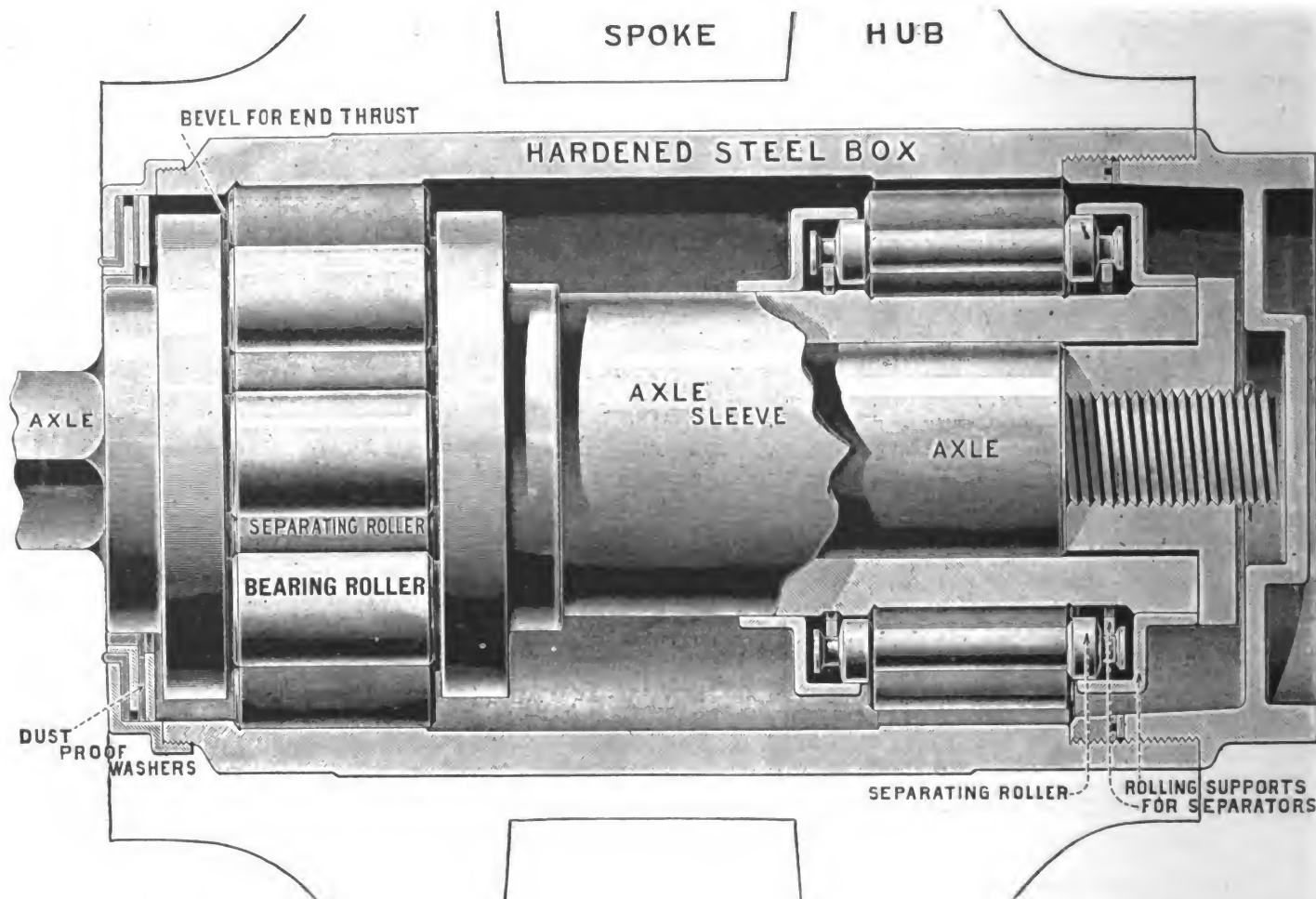
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OFFICES, 27 State Street, **BOSTON, MASS.**
 FACTORY, 32-40 Blinford Street,



The A. R. B. Bearing is adapted to heavy work of all kinds. It has a number of features which distinguish it from any other Roller Bearing ever manufactured, among them are the following:

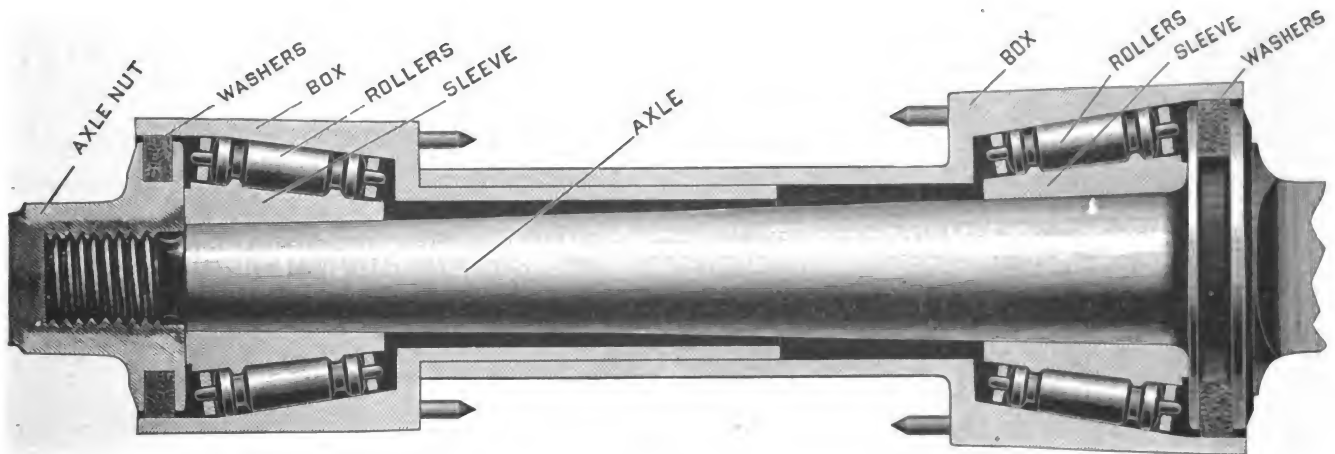
1. Its rollers are not held by pivots or confined in a cage of any kind.
2. The device for separating the bearing rollers is a purely rolling device, namely, a smaller set of intermediate rollers.
3. These separating rollers are held in position by purely rolling supports. So that there is no rubbing friction in the whole bearing, but only that slight friction which comes from the pure roll of one polished steel surface upon another.
4. All of the rolling parts are of a fine grade of steel, carefully hardened and accurately ground.
5. There is no complicated provision for the end thrust, but merely a hardened bevel against which the rollers roll when there is a thrust. These bevels have been found capable of withstanding the heaviest shocks and strains.
6. Once oiled (to prevent rust only) and the bearing needs no attention for six months or more.
7. A large electric cab wheel weighing about 150 pounds, and hung on a stationary axle, will run for one hour and ten minutes when once set in motion by the hand. When accurately balanced the weight of a piece of blotting paper will set it in motion.
8. The A. R. B. uses larger rollers, in proportion, than any other roller bearing, and consequently a slightly larger box is necessary—a fact which is amply justified by the great gain in strength, power and wearing qualities.
9. The A. R. B. is fully guaranteed, and it is about the only roller bearing that is guaranteed.
10. It is adaptable to a railroad car or a bicycle, to shafting and machinery of all kinds; for high speeds it is particularly successful, because of the absence of heating.
11. After a long series of competitive tests with many other roller and ball bearings, the A. R. B. has been adopted by many of the largest automobile concerns in this country.
12. With a pure rolling action, an ample bearing surface, and the most accurate mechanical construction, the A. R. B. stands to-day the only practically and theoretically perfect bearing in the field.

WRITE FOR CIRCULAR. THE FOREIGN PATENTS FOR SALE.

An exhibit of the American Roller Bearing Company may be seen at the Paris Exposition of 1900, consisting of several odd wheels and models and two motor vehicles fitted with the A. R. B., one a Riker Electric Vehicle, the other a Locomobile.

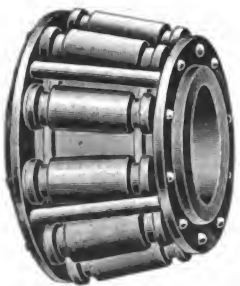
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TIMKEN ROLLER-BEARING AXLE.



PATENTS:
606,635, June 28, 1898. 606,636, June 28, 1898.

THE FOLLOWING ARE OUR CLAIMS:



SLEEVE CAGE & ROLLERS.

- 1st. 50 per cent. reduction of draft.
- 2d. Absolutely no end friction.
- 3d. No rattling, few parts and simplicity.
- 4th. The rollers being solid, cannot flatten or break.
- 5th. They do not touch each other; therefore no friction. All is rolling motion.
- 6th. Simplicity of adjustment. The slightest wear can be taken up.
- 7th. Adjustment not affected when removing wheel.
- 8th. The rollers being caged cannot lose their proper position.
- 9th. Do not get out of repair or wear out.
- 10th. All parts made of fine steel, case hardened.
- 11th. Should be oiled every three to six months to keep them from rusting.
- 12th. No hot box possible.
- 13th. Water and dust proof.

WE FULLY GUARANTEE THE AXLES IN EVERY RESPECT.

After years of study and research, we have perfected the lightest running, simplest and most durable anti-friction Axle on the market.

A TRIAL ORDER WILL PROVE THAT ALL OF OUR CLAIMS ARE AS REPRESENTED.

FOR PRICES AND OTHER INFORMATION, APPLY TO

TIMKEN ROLLER-BEARING AXLE CO.,

HENRY TIMKEN, President.

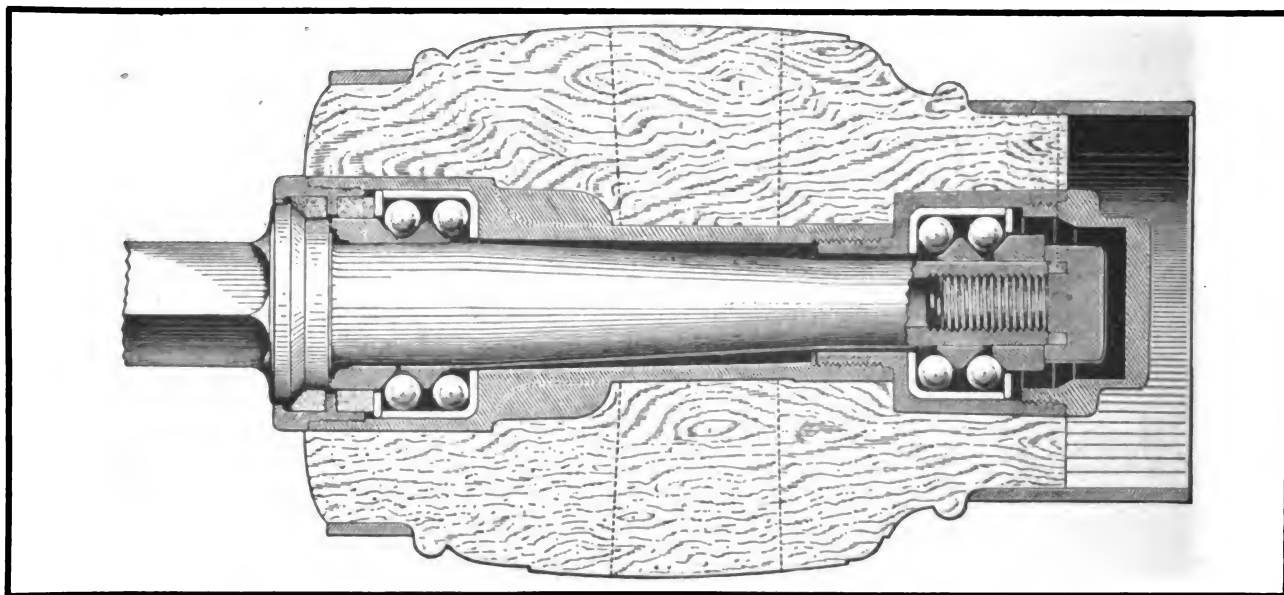
Second and Branch Streets,

ST. LOUIS, MO.

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• THE • BAKER BALL BEARING AXLES

THE MOST NEARLY PERFECT ANTI-FRICTION AXLES IN THE WORLD.



THEY REQUIRE NEITHER SKILL NOR A MECHANIC TO CARE FOR THEM. ARE ADAPTED FOR ALL KINDS OF VEHICLES USING AXLES FROM 5-8 INCH TO 5 INCHES



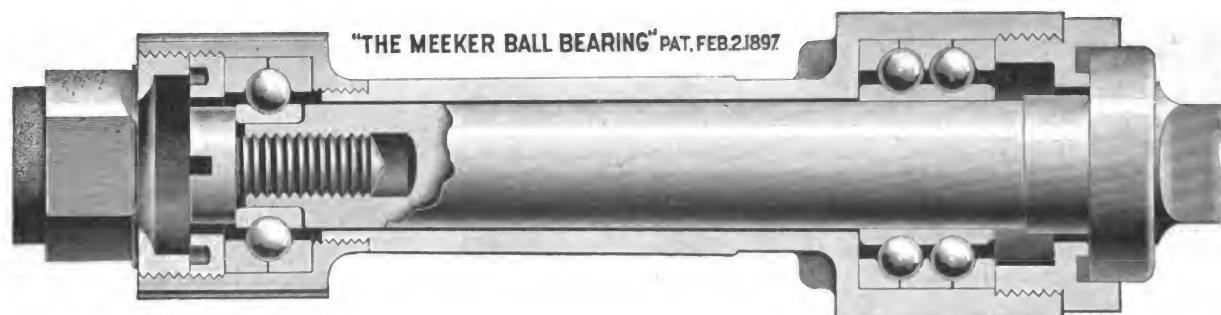
These axles have been found by some of the most reliable automobile companies to be the best and most satisfactory anti-friction axles on the market.



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Townsend Building, Broadway and 25th Street,
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THE MEEKER BALL BEARINGS



Cheapest! Because they are the best. All sizes built in proportion to the work required of them.
Write for our Catalogue of Carriage Specialties.

LOW WOOD HUB AND SARVEN WHEELS.

The Best Wheels Made, with Pneumatic Tires and Ball-Bearing Axles, for Runabout Wagons and Automobiles.



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A SUCCESSFUL AXLE

EMPIRE AND CHICAGO
BALL-BEARING AXLES and DUST PROOF BANDS,
For Carriages, Trucks and Motor Vehicles.
(Sizes, $\frac{1}{2}$ to 4 inches.)



BALL-BEARING AXLE DEPARTMENT
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CHICAGO.

ESTABLISHED 1872.

Address All Communications to the Company.

Especially Satisfactory for Heavy Work.

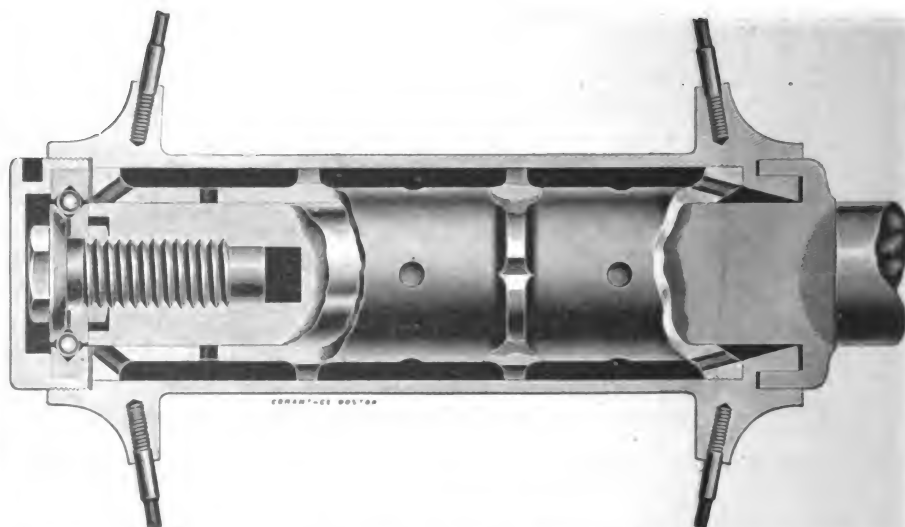
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MORRILL & WELLS FIFTH WHEEL AND AXLE.

THE ONLY AXLE EVER PRODUCED (THAT RUNS ON A SPINDLE) THAT HAS NO FRICTION AGAINST EITHER END OF BOX. WILL CARRY MORE OIL WITHOUT RUNNING OUT AT COLLAR, AND WILL RUN LONGER THAN ANY OTHER WITH ONE OILING.

• • Absolutely Noiseless. • •

Patented March 24, 1885.
Patented March 7, 1899.



SHOWING CROSS SECTION.

THIS FIFTH WHEEL IS A DIVIDEND EARNER. SIMPLE IN CONSTRUCTION. OIL CANNOT GET OUT, OR DIRT GET IN. ABSOLUTELY NOISELESS. • • • •
SEND FOR CATALOGUE. • • • •

WRITE FOR PARTICULARS, WE CAN INTEREST YOU.

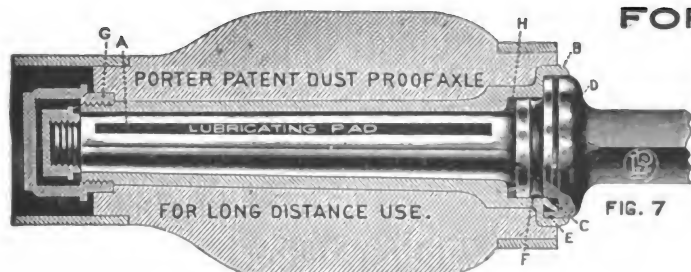
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BUILDER OF **Eight Carriages** of Every Description.

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"THE FAMOUS PORTER PATENT DUST PROOF AXLE."

FOR LONG DISTANCE USE.



THE ONLY "2,500 MILE" STANDARD AXLE IN EXISTENCE

By actual test this Axle has run 2,500 miles with one oiling, and 1,500 miles with one oiling without the *Lubricating Pad*. • • • •

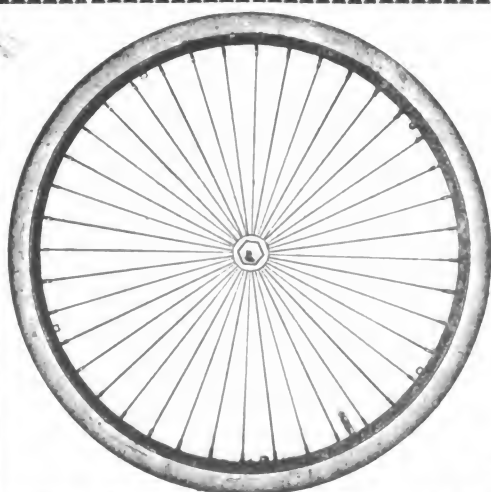
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This axle is fitted with the Famous Porter Patent Dust Proof Collar and V-shaped extension, making it absolutely dust and water-proof.

7,000 sets in use. Never had a ball crush. Never had a call for repairs. Write for particulars.

Prices now within reach of all.

Manufactured by **Buchanan Ball Bearing and Dust Proof Axle Co.,**
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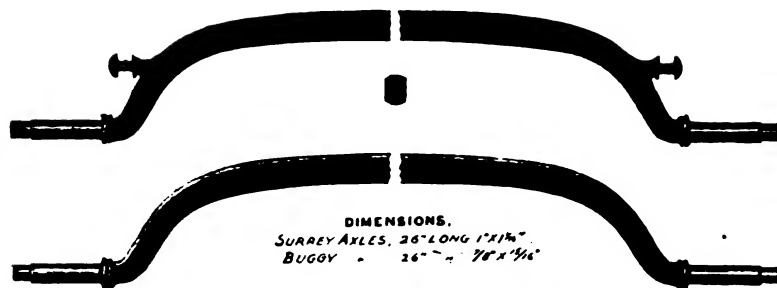
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of all descriptions, high grade ball bearings with a perfect adjusting device. Light and durable. "Fastest" wheel on the market. Fully prepared to furnish all sizes and designs. Send for catalogue.

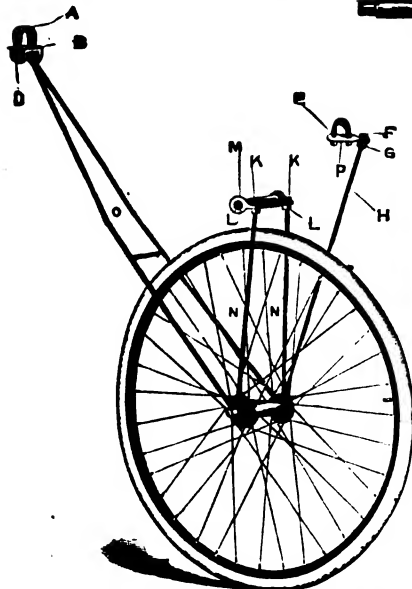
SPEEDWAY WHEEL CO., Ware, Mass.

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WIRE
WHEELS.



AXLES.



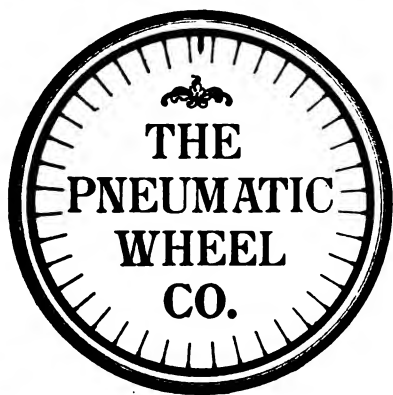
SULKEY WHEELS, with or without Attachments. 1 1/4 in. CUSHION. 1 1/2 or 2 in. PNEUMATIC. 2 or 2 1/2 in. PNEUMATIC. 2 1/2 or 3 in. PNEUMATIC.

Ball or Plain Bearings. Axles to Specifications. Perfected Cone Adjustment.

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MANUFACTURERS,

YOUR 1900 PNEUMATIC WORK WILL

*Look Better,
Wear Better,
Ride Better,
Give Better Satisfaction,
and Bring Better Prices if*

FITTED WITH OUR PNEUMATIC WHEELS.

SIMPLEST, BEST AND STRONGEST.

BE A LITTLE AHEAD OF THE TIMES. USE OUR WHEELS.

THE PNEUMATIC WHEEL CO.

FREEHOLD, NEW JERSEY, U. S. A.

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Original Manufacturers of the



GENUINE CONCORD AXLES.



CONCORD EXPRESS AXLES.



BROWN'S PATENT ROLLER BEARING AXLES.

*All of carefully selected stock and of
superior workmanship. ✂ ✂ ✂*

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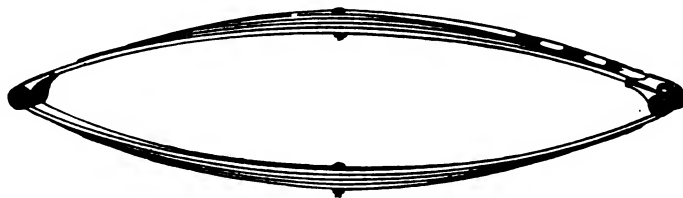
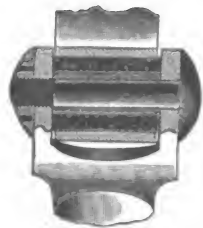


Address

CONCORD AXLE CO., PENACOOK, N. H.

ELLIPTIC BUGGY SPRINGS IN STOCK.

Button Head, English Head and Open Head, ready to finish. Bright or Half Bright. Correspondence Solicited.

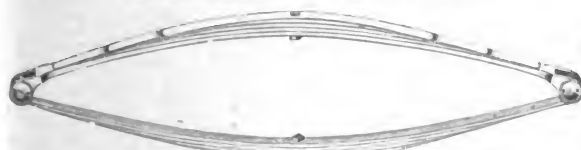


DEXTER SPRING & GEAR CO., PITTSBURG, PA.,
U. S. A.

SPRINGS AND AXLES.

"OPEN HEADS," Either Plain or Rubber Bushed.

ANY STYLE WITH "FELT PAD," SELF-LUBRICATING.



Capacity, 150,000 Sets Axles; 3,000 Tons Springs per annum.



"DUG OUT" COLLAR WITH "DOUBLE FLANGE" BOX.

THE HESS SPRING & AXLE CO., CARTHAGE, OHIO.

THE SCRANTON AXLE WORKS,
SCRANTON, PA.

Manufacturers of
FINE VEHICLE AXLES
of Every Description.

OUR O. V. B. CONCORD EXPRESS is the best in the market.

We have sold in Chicago alone over 10,000 sets in four years of "OUR VERY BEST" Concord Axles, and not one complaint.

An old proverb says: "There Is Nothing New Under the Sun." But there are exceptions to every rule.
WE HAVE SOMETHING ENTIRELY NEW.

**THE LATEST
NOVELTY IN
SPRINGS.**



**THE EYE IS NOT
WELDED ON THE
SPRING.**

THE CELEBRATED FORSBERG RUBBER HEAD SPRING.

This is the only Elliptic Spring made without the eye welded on the spring. It therefore retains the flexibility of the entire length of the spring. No wear on bolt and rubber cushion. The only Elliptic Spring that can be used on Automobiles with success. It is a "Daisy." Send for sample and be convinced. We also manufacture a full line of Gears, Springs and Axles for pneumatic work—over fifty styles. Address all correspondence to

THE FORSBERG SPRING & AXLE CO., 310-312 South James Street,
ROME, N. Y., U. S. A.

Please mention "The Hub" when you write.

A Few of the Specialties

Manufactured by

DALZELL AXLE CO., SOUTH EGREMONT, MASS.

While they cost more, if you use them you will know the reason why.

Doctors' Special.



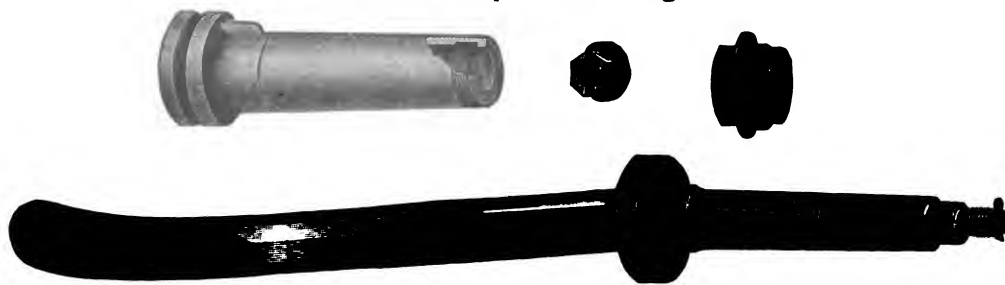
One valuable feature of this Axle is the broad washer bearing at both collar and nut, the broad metal bearing at the nut being obtained by making bridge and oil chamber as shown in cut. Also the increased diameter of arm adds to strength and safety. Fitted only with solid Wrought Iron Case Hardened Boxes.

Berkshire.



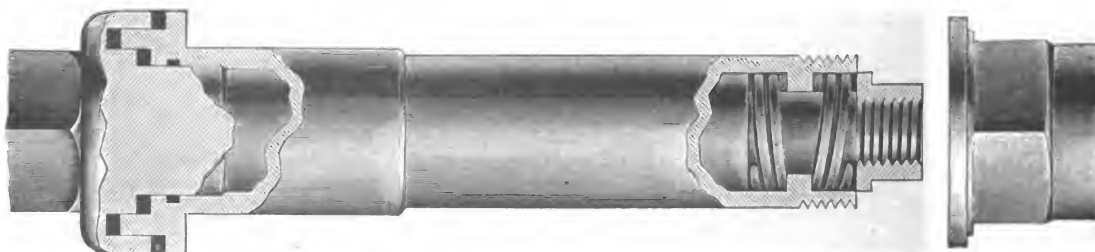
This Axle is our Improved Collinge Collar, having wide washer bearings and large oil chambers at *each end* of box, also increased diameter of arm for safety. The finest axle in the world for Station Wagons, Spider Phaetons, Rockaways and all vehicles of moderate weight. Fitted only with Solid Wrought Iron Case Hardened Boxes. Sizes, 1 in., 1 1-16 in., 1 1-8 in., 1 3-16 in., 1 1-4 in.

Dalzell's Improved Collinge.



The merits of this Axle are well known, as it has been used continuously for fifteen years by many prominent builders of fine coach work.

Killam Double Spring Washer.



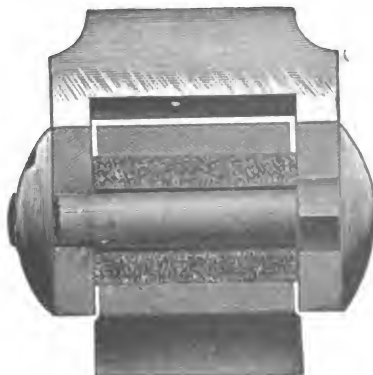
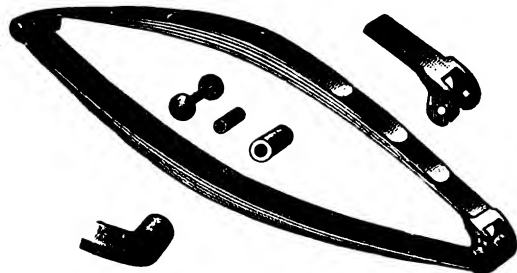
The most expensive axle manufactured, but the most popular with those who have had a practical experience in its use. No adjustment of nuts or D's and no replacing worn out leather washers ever required. Fitted only with our Wrought Iron Case Hardened Boxes and perfectly adjusted. The double spring takes up all end thrust and *very much* reduces the strain on the wheels.

Elliptic and Coach Platform Springs

WITH RUBBER OPEN-HEADS.

LARGE SIZE.—Designed for Broughams, Landaus and Coaches.

SMALL SIZE.—Designed for Buggies and Light Carriages.



The Rubber Open-Head

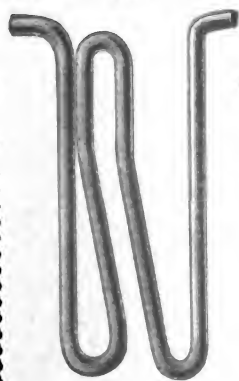
SPRINGS

Work Freely Without Friction.

No Binding or Squeaking in the Heads or Eyes.

Springs of Every Style and Pattern to order,
ALSO CURTAIN ROLLERS and CONCEALED HINGES.
Exclusively First-Class Work.—The Best that Can be Made.

SPRING PERCH CO.,
BRIDGEPORT, CONN.



IMPROVED POLE SPRING.



BRAKE SPRING.

WE CARRY EIGHT SIZES POLE AND BRAKE SPRINGS IN STOCK.

GET OUR CIRCULARS GIVING DIMENSIONS.

SPRINGS FOR ALL KINDS OF MACHINERY
MADE TO ORDER.

RAYMOND MFG. CO., Ltd.,

CORRY, PA.

This anti-rattler drives in or out in an instant, but never comes out accidentally. The best Wire Drive Anti-rattler made.

.....FIRST MADE IN AMERICA.....

"HAY-BUDDEN," SOLID WROUGHT ANVILS.



MADE OF **Best AMERICAN Wrought Iron,**

Best AMERICAN Cast Steel:

FORGED BY **Best AMERICAN Workmen.**

Experience has proven their worth and demonstrated that **Anvils** can now be made in this country **Superior in Quality, Form and Finish** to any imported.

FULLY WARRANTED.

SEND FOR DESCRIPTIVE CIRCULAR.

HAY-BUDDEN MFG. CO.,

254-278 NORTH HENRY STREET,
BROOKLYN, N. Y.

Received Gold Medal, Highest Award for Anvils at Omaha Exposition, 1898.



Our assortment supplies the demand in the States and foreign countries for any style of yoke or centre.

Every Yoke is Tested and Every Centre is made of Oak Tanned Harness Leather.

COVERT'S SADDLERY WORKS

1875



1898

We are the oldest and most extensive manufacturers of Neck Yokes and Neck Yoke Centres. Also Harness Snaps, Horse and Cattle Ties, Wagon Jacks, etc., etc. Ask your jobber for Covert's.
FARMER, N. Y., U. S. A.

Please mention "The Hub" when you write.

Wheelbarrows and street cars need no Fifth Wheel. It is told of an inventor in a noted carriage city, that he built a buggy without one. It was famous for what it lacked.

The Osgood Fifth Wheel, made only by THE DAYTON MALLEABLE IRON CO., is famous for what it *has*.



Naked axle gears require a return to Fifth Wheels of the simplest form. The Osgood Fifth Wheel is more than an old-fashioned double-saucer turn-plate. It is a Fifth *Wheel* pure and simple, with a little steel axle of its own. It is provided with removable, adjustable stops.

It is a good thing.

Circular? or Sample? Which shall it be?

THE DAYTON MALLEABLE IRON CO., DAYTON, OHIO.

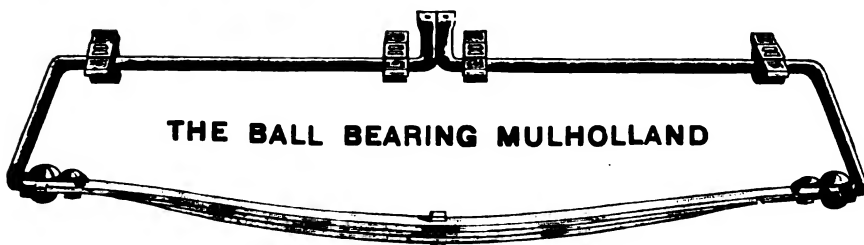
SPRINGS



That Have Stood
The Test of Time.

Hundreds of Thousands of them
in use.

Adapted to All Classes of Light
Vehicles.



WE MANUFACTURE HIGH GRADE VEHICLES IN THE WHITE.

~~~~~  
WRITE FOR CATALOGUE AND PRICES.  
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MULHOLLAND SPRING AND GEAR CO.,

DUNKIRK, N. Y., U. S. A.

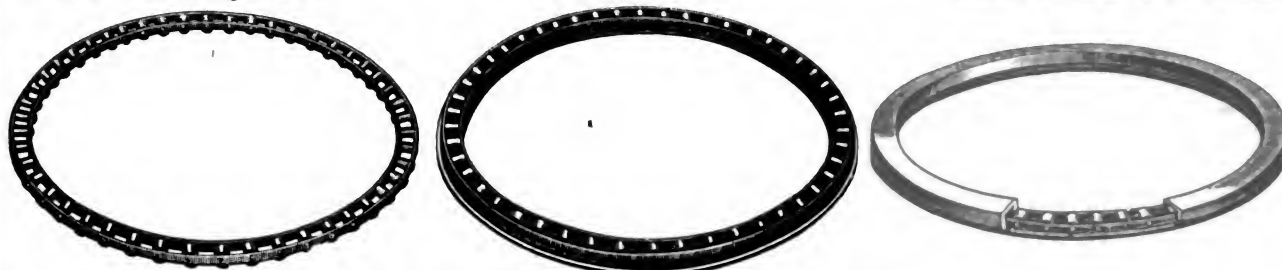
Please mention "The Hub" when you write.

THE NIELSON Roller-Bearing Fifth Wheel

Is the only PERFECTED and PRACTICAL ROLLER-BEARING FIFTH WHEEL on the Market to-day.

HAS NO EQUAL.

DON'T BE FOOLED.



WHY THE NIELSON IS THE BEST.

It is the product of a practical wagon builder, who has made a careful study of his trade and the necessity of developing something new in the way of a fifth wheel that would overcome the friction caused by the old circle in use on all kinds of platform vehicles. The present fifth wheel is the outcome of years of experiment, and contains all the good features lacking on other fifth wheels. The rollers, while an important part of the Nielson patent, without the other features would be as worthless as some others that are offered as "the best."

Don't let anybody tell you that So and So's Roller Bearing Fifth Wheel is just as good as the Nielson.

Roller-bearings, like ball-bearings, to prove of value must be properly housed. This is one of the greatest practical points on the Nielson, as it is constructed so that neither dust nor the elements to which fifth wheels are subject can affect the rollers.

As the rollers overcome all friction, the use of oil, grease or other lubricants is obviated, and thus when 'once the Nielson is attached to a vehicle the user need give this part of the vehicle no further thought, as it will outlast any vehicle. It always works easy and never gets out of order. No worry about broken shafts or poles, as the Nielson turns easily under the heaviest load. It is a godsend to dray horses as well as to the users of vehicles for mercantile purposes, as the Nielson not only saves the horses but prolongs the life of the vehicle.

YOU WANT THE BEST.

GET THE NIELSON.

Ask your dealer or write for full particulars to

**CHRISTEN NIELSON, 745 Third Avenue,
BROOKLYN, N. Y.**

THE "TRACER" TELLS.

THE "TRACER" TELLS Isn't it worth your while to learn what other Wholesale merchants know about Retailers who seek credit from you? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth your while to learn from other Wholesale merchants what record your would-be customer has made with them? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth your while to be able to ask several thousand merchants everywhere what they know about a man you want to know about? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth while to learn that one of your customers, who is prompt in New York, Philadelphia or St. Louis, is getting very slow pay in Chicago and Boston? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth while to learn your customers' inside business history, not from outside guesses, but from inside records; the actual experience of those who have dealt with them? To learn those things that determine character and business ability as well as financial strength? The things that make you trust or distrust a man? The things that come up in actual business dealings, but which an outsider cannot know? The "Tracer" tells.

THE "TRACER" TELLS Is he honest? Is he tricky? Is he careful, prudent, shrewd? Has he the qualities of success? Does he cancel orders unjustly? Does he make false claims for deductions? Is his record good or bad? Are his methods good or bad? The "Tracer" tells.

THE "TRACER" TELLS and it is the only thing that tells. Every business man leaves a record, widely scattered in the ledgers and in the minds of merchants far apart. That record, if gathered, is the best proof of what a man actually is, in his business relations. The "Tracer" gathers these scattered leaves and makes the record complete. The "Tracer" goes to thousands of Wholesale merchants everywhere. From them come a dozen detached bits of experience, concerning one man: together they show his whole business past, and his present condition. Has he ever bought? The "Tracer" tells. Is he getting slow? The "Tracer" tells. Is it time for caution? The "Tracer" tells.

THE "TRACER" TELLS this history to us in fragments. We tell it complete to all who supply the fragments. They supply a few facts; in return they get a complete history. In addition to our unrivaled "TRACER" reports, this Agency gives all the benefits that any other Mercantile Agency can possibly furnish, including a Reference Book of Credits, semi-annually, January and July issues. Don't subscribe to any Agency until after you have first examined into this new and improved system. For terms, write—

NATIONAL MERCANTILE AGENCY,

SUCCESSORS TO

EALY'S "BLUE BOOK" AND THE BANKERS' COMMERCIAL LEAGUE.

NEW YORK CITY.

Please mention "The Hub" when you write.

Carriage Forgings.

A FULL LINE OF

Carriage Forgings

...AND...

Special Drop Forgings.



Send for
Catalogue.

**RICHARD ECCLES,
AUBURN, N. Y.**

SEE THAT GAP?
There's Money in it for You.

That opening between the jaws prevents rattling.
 No other way to effectively prevent rattling has been discovered up to April 1st, 1900.

No other shaft coupling has a gap.
 No other can have one. The Bradley gap is covered by far-reaching patents.
 You see the loop over the end of the jaw.
 This steel loop is attached to a spring which constantly pulls down on the jaw.
 As the jaw is pulled down it takes up all wear on the leather packing—keeps the jaws tight all the time—absolutely prevents rattling.
 The wideawake carriage man don't need a magnifying glass to see the money in this coupling.
 When you sell a customer the best coupling on the market you increase the value of your work.
 It makes your vehicles more to be desired.
 You'll sell more jobs and you'll sell them easier.
 Your profits will be larger and your trade better satisfied.
 Think it over and you'll agree with us.
 All this will happen to you if you use the Bradley Shaft Coupling.

C. C. BRADLEY & SON, Syracuse, N. Y.

CHARLES AUSTIN BATES N. Y.

SHAFT COUPLINGS.

Over 100,000 Sold During 1899.

BAILEY'S

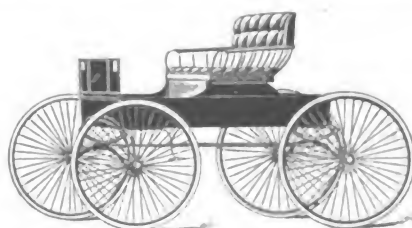


OPEN.



CLOSED.

BULL DOGS



BAILEY'S CELEBRATED WHALEBONE
WAGON. PNEUMATIC GEARS IN THE
WHITE

S. R. Bailey & Co.

Amesbury, Mass.,
U. S. A.



Lightning Coupler.

Patented
May 30, 1899.



A MODEL
of
Simplicity.

The only three piece Coupler on the market. The strongest and cheapest.

A General Line of Carriage Supplies.
CINCINNATI CARRIAGE GOODS CO., CINCINNATI, OHIO.

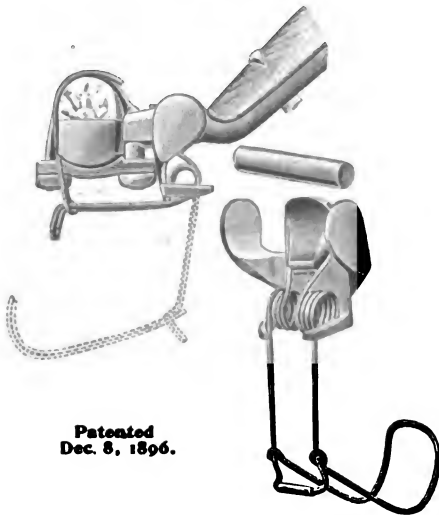
**Manufacturers,
Jobbers,
Dealers**

You must use an anti-rattler and quick shifter. It must be the cheapest and best seller, one that won't break, rattle, loose off, wear out, or cost too much.

This must be the **STAR**.
[PATENT ALLOWED.]

STAR MFG. CO., Princeton, ILL.

MENTION THE HUB.



Patented
Dec. 5, 1896.

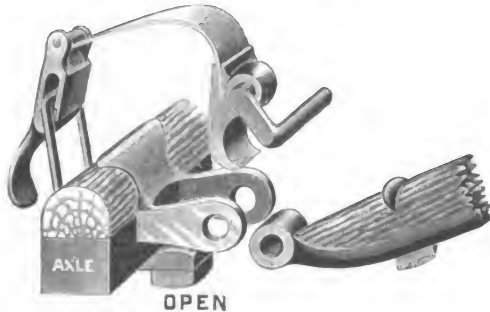
To Manufacturers and Dealers.

It does the work and don't require any tools to adjust. Three years' actual use and not one complaint. Manufacturers and Jobbers in buggies can have a sample pair for the asking. Cheap, neat, safe and durable.

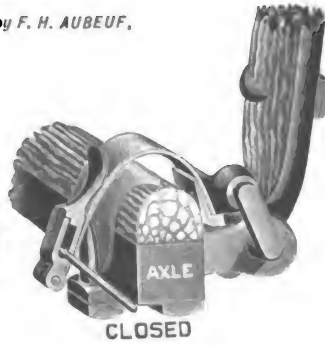
**THE BROCKSMITH ANTI-RATTLER CO.,
CARROLTON, MO.**

THE SAFETY QUICK COUPLER AND ANTI-RATTLER.

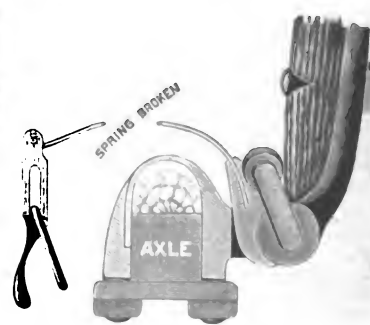
Patented Aug. 20, 1899, by F. H. AUBUEF.



OPEN
This cut represents the Safety ready to put on the coupling when the shafts rest on the floor.



CLOSED
This cut represents the Safety Quick Coupler and Anti-Rattler in position when the horse is harnessed to the shafts.



SPRING BROKEN
This cut shows the impossibility of dislocating the bolts when the vehicle is in use, thereby insuring against accident if spring should become broken.

This operation is performed quicker with our Coupler than with any other Coupler on the market.

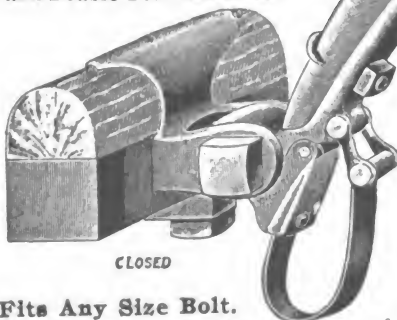
It is so arranged that the operator can easily see to make the coupling without changing his natural position, as it is applied from the top of axle and does not require special clip or shaft eye.
I use the best steel springs and the best hand-forged bolts.

Send for Price List.

Sample by mail at wholesale price.

MANUFACTURED BY **F. J. AUBUEF, Oneida, N. Y., U. S. A.**

"Quickest," "Quietest,"
"Neatest," "Safest,"
"Best" and "Cheapest."
Will Please Your Customer
and Double Your Business.



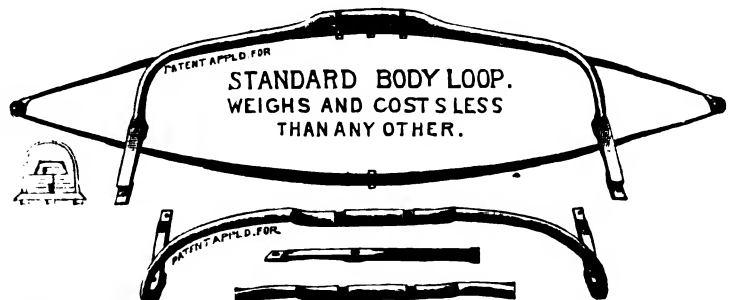
CLOSED
Fits Any Size Bolt.
No Bushings Used.

Note.

"IT JUST DOES IT."
and don't need any
explanation.....

You know all about it.

It stands without a successful rival, and is sold strictly on its merits. Write us.



PATENT APPLIED FOR
STANDARD BODY LOOP.
WEIGHS AND COSTS LESS
THAN ANY OTHER.

Just what you are looking for. You don't have to take the spring apart to put it on. No holes in springs. No malleable. No filing, as every part of the **Standard Body Loop** can be polished on a belt. "Never Gets Loose."

STANDARD COUPLER WORKS, LANCASTER, PA.

Please mention "The Hub" when you write.

Samples of our Electrotypes

FOR ADVERTISING PURPOSES.

FINE CUTS

— AND —

Catalogue Work

OUR SPECIALTIES.



No. 9-B.



No. 741.



No. 766.



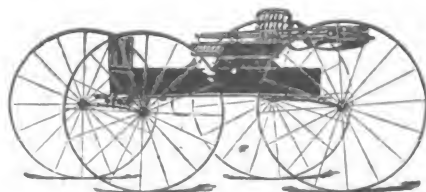
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No. 14-B.



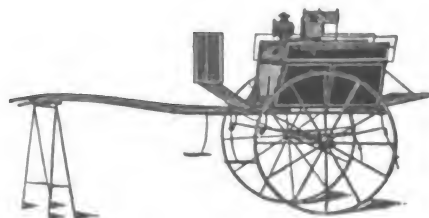
No. 33-B.



No. 2-B.



No. 25-B.



No. 745.



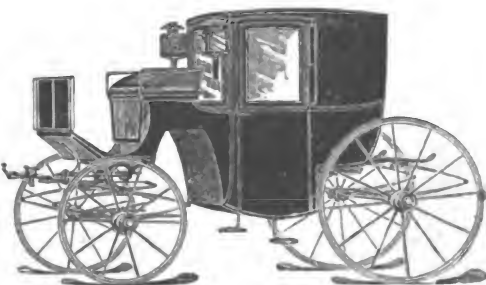
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No. 746.



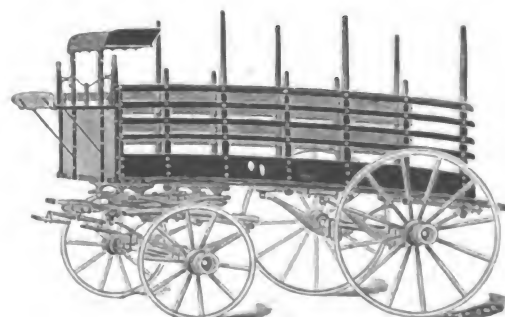
No. 11-B.



No. 30-B.



No. 749.



No. 760.

Do not forget

that the quality of your work is often misrepresented by using POOR CUTS, and that when you need them we can always supply you with the very finest.

Only 75 Cents Each.

SEND TO
Trade News Publishing Co.,
24-26 MURRAY STREET,
NEW YORK.

ONLY 75 CENTS EACH.

The McGOVERN COLD TIRE SETTING MACHINE

HAND AND POWER MACHINES

TO SUPPLY THE DEMANDS OF THE
CARRIAGE AND WHEEL TRADE, AND ALSO THE BLACK-
SMITH AND GENERAL REPAIRER.

A power machine with an automatic attachment, and where the operator has absolute control of the machine; can stop or start it instantly at any point in its operation.

Simple in construction. Powerful in operation. Reasonable in price. Does its work thoroughly, accurately and rapidly, giving proper and uniform dish to wheels.

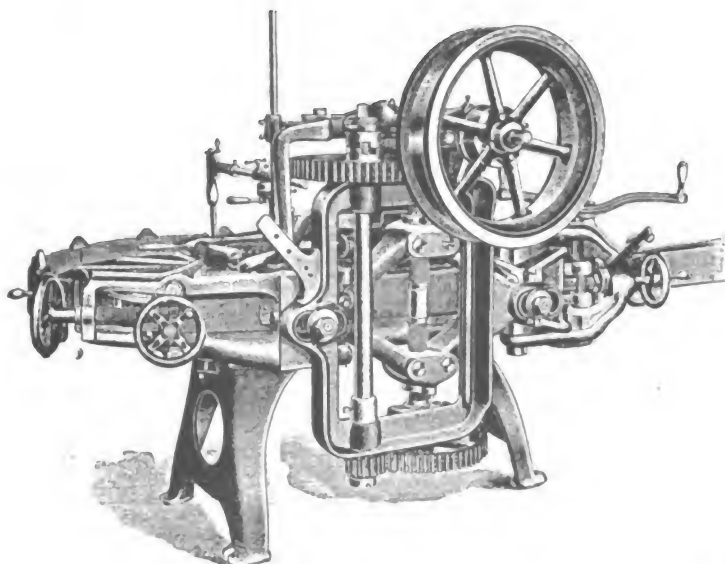
THE NEW MODEL McGOVERN COLD TIRE SETTING MACHINE with its increased capacity, simplicity and strength, all three points being more than tripled in this new machine, we guarantee to set Tires ranging from $\frac{1}{4}$ inch to $2\frac{1}{2}$ inch \times $\frac{1}{4}$ inch. Our daily capacity from 800 to 1,000 wheels.

NOTICE.—We now offer old model hand and power machines at a low figure.

.....SEND FOR DESCRIPTIVE CATALOGUE.....

Address all correspondence to

**The Tire Setting Machine Co.,
LIME ROCK, CONN.**



Barnes' Upright Drills,

8 in. to 42 in. Swing.

Single, Back Geared,
Multiple, Sliding Head,
"Series," Stationary Head.
Power Feed, Worm Feed,
Automatic Stop, Lever Feed.

Send for Catalogue.

W. F. & Jno. Barnes Co.,
588 Ruby St., Rockford, Ill.



20 in.
Swing.

BARNES' New Friction Disk Drill. FOR LIGHT WORK.

Has these Great Advantages:

The speed can be instantly changed from 0 to 1800 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage. Send for catalogue.

W. F. & Jno. Barnes Co.,
588 Ruby St., Rockford, Ill.



PATENT ROLLER OR WEAR IRONS

FOR CARRIAGES, RUBBER-TIRED VEHICLES,
LUMBER, DELIVERY AND FARM WAGONS.

FAR SUPERIOR TO ANY OTHER ON THE MARKET FOR THE FOLLOWING
REASONS.

FIRST—They *always* roll and *never* rattle, being made with adjustable set screws, and can be affixed to a carriage or wagon in a few minutes by any person.

SECOND—They never break, because they are made from best malleable iron and hardened steel.

THIRD—*Impossible* to upset any vehicle which has these Wear Irons on.

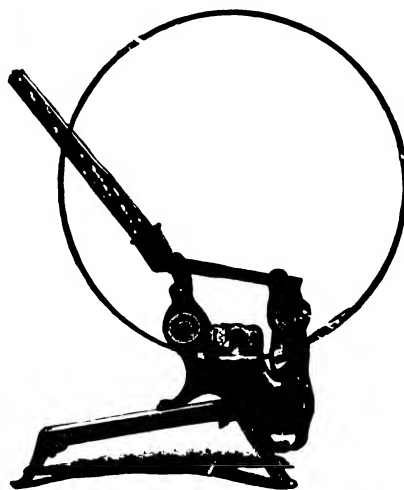
FOURTH—It will save a pair of tires a year.

F. J. MARLEY & CO.,
SOLE MANUFACTURERS,
—→LITTLE FALLS, N. J.

THE IDEAL TIRE UPSETTER.

The advantages of the Ideal are:

The tire cannot kink.
One man can operate it.
One movement does the work.
It will shrink light Buggy tire.
It will shrink Heavy Wagon tire.
It will shrink Truck tire.
It will shrink perfectly all kinds and thicknesses of tire.
It is the easiest handled.
It is the most durable.
It is the latest and best.



Send for Circular and Price.

Manufactured only by

WEYBURN & BRIGGS CO., 718 Main St., Rockford, Ill., U. S. A.

White's Adjustable Patent Brake.



Write for circular
and price to
GEO. WHITE,
Rock Island, Ill.

"Silver's" New Band Saws

for CARRIAGE MAKERS,
WAGON MAKERS AND
WOOD SHOPS OF EVERY KIND.

IN SIZES:

20 in. machine for foot or belt power.
24 in. machine for foot or belt power.
32 in. machine for belt power.
36 in. machine for belt power.

LIST PRICES,

\$50.00 to \$130.00.

Special Discount to Carriage
and Wagon Makers.

These machines are symmetrical and
modern in design, and absolutely rigid
and strong for the heaviest work
coming within the range of each
machine.

Ask for 1899 in page
Circular showing all
sizes.

Manufacturers also of "DOLE'S"
and "SILVER'S" HUB BORING MA-
CHINES, "DOLE & DEMING" SPOKE
TENON MACHINE, "SILVER'S" and
"ADVANCE" DRILLS, Etc., Etc.

EVERY MACHINE GUARANTEED.

THE SILVER MFG. CO.

339 Broadway,

SALEM, OHIO, U. S. A.

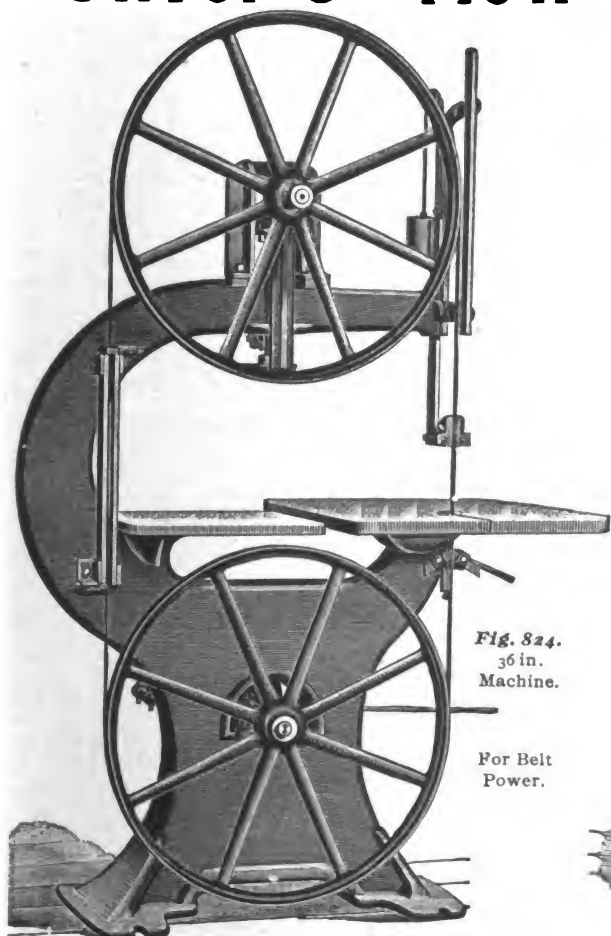


Fig. 824.
36 in.
Machine.

For Belt
Power.

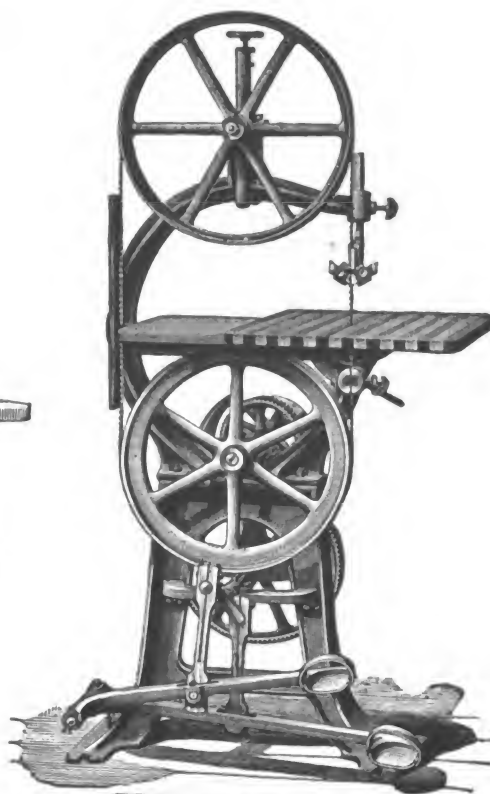
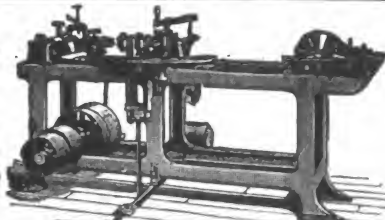


Fig. 741.

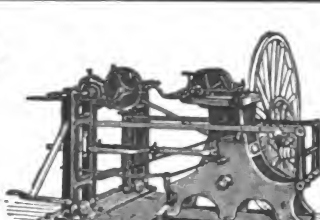
30 in. Machine. Combined Foot or Belt Power.



Improved Automatic Axle Gaining Machine.



Felly Cut-Off, Boring & Dowelling Machine.



No. 2 Wheel Polisher.

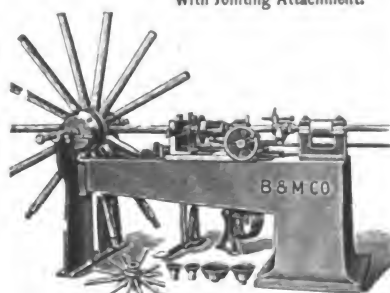


Improved Gear Rounding Machine,
With Jointing Attachment.

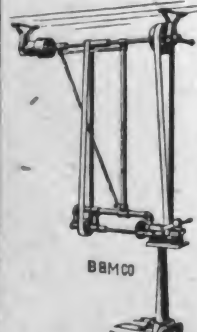


IMPROVED WHEEL, HUB-BORING
AND BOXING MACHINE.

THE BENTEL & MARGEDANT COMPANY.
MANUFACTURERS OF
WOOD WORKING MACHINERY.
- HAMILTON, O., U.S.A. -



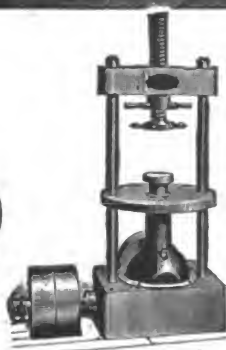
HEAVY GIANT WHEEL TENONER.



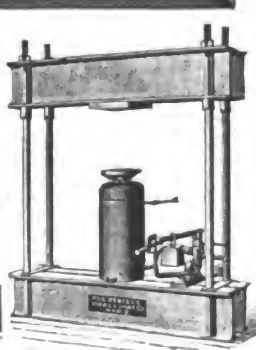
Hub Band Grinding and
Polishing Machine.



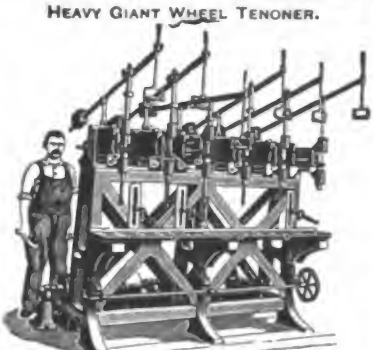
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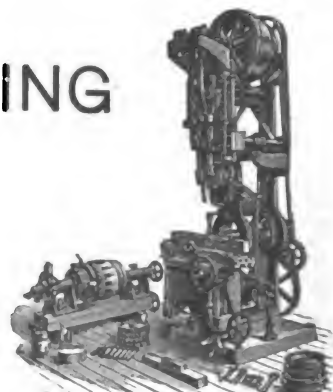
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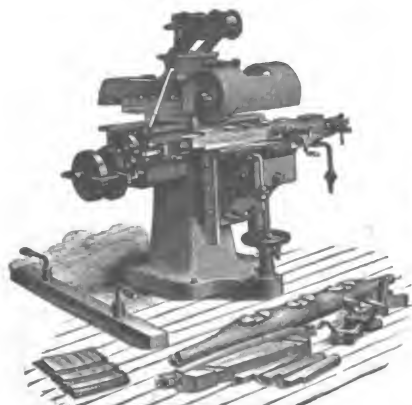
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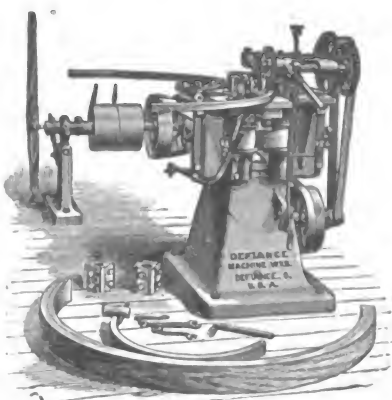
24 Inch Horizontal Drum Polisher.



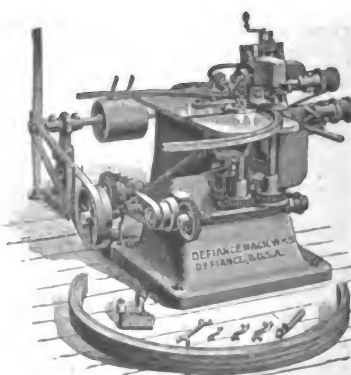
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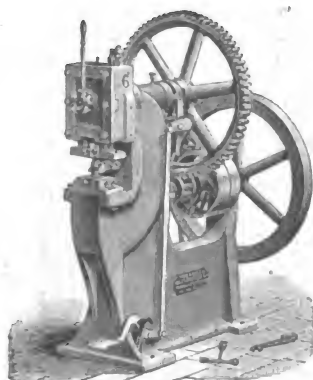
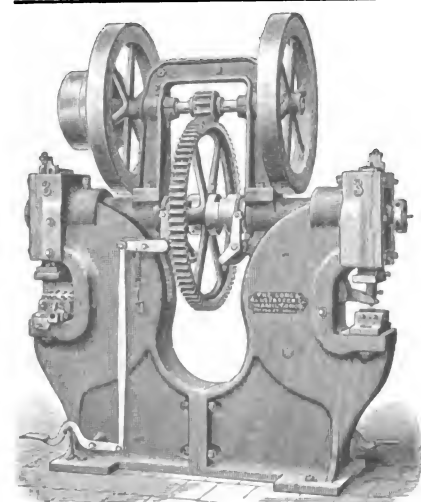
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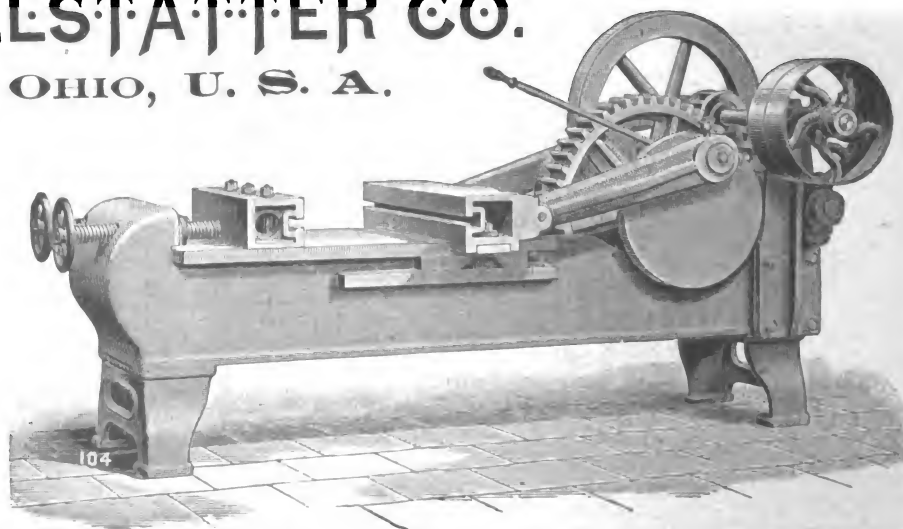
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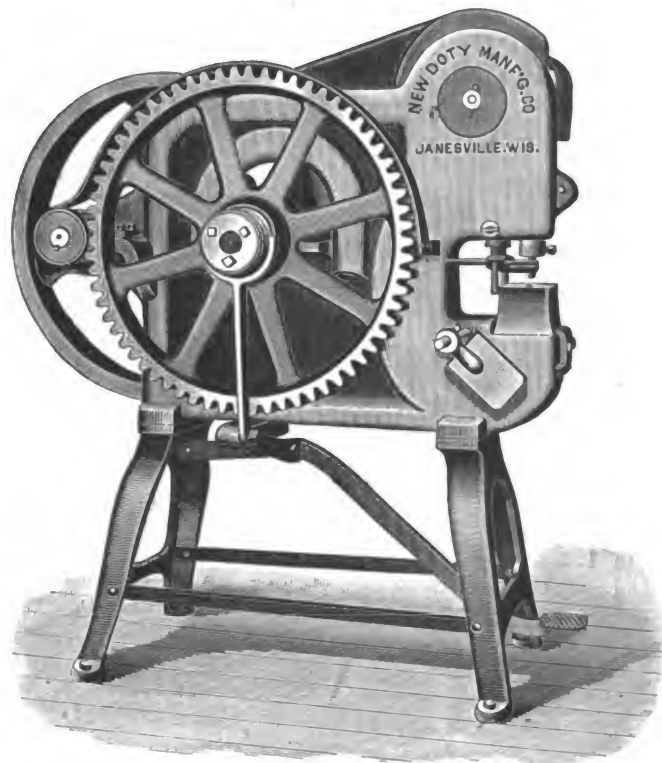
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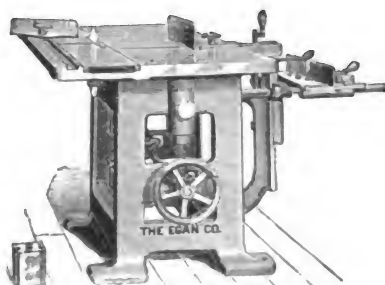
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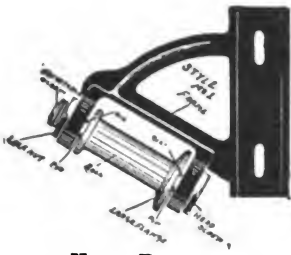
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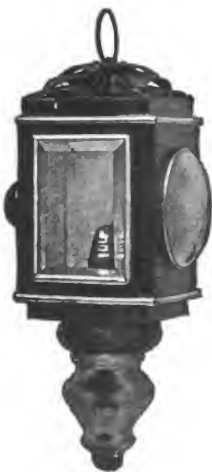
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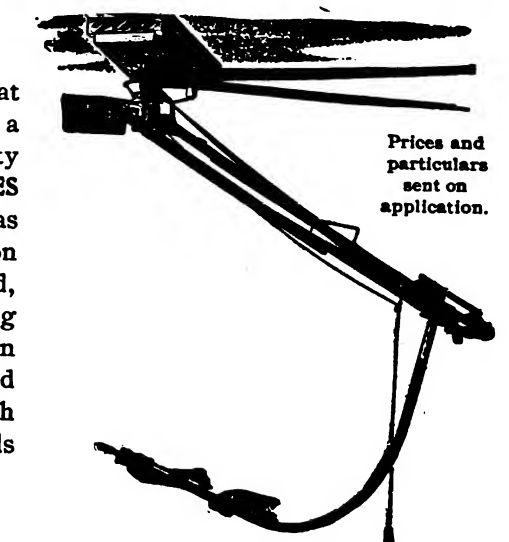
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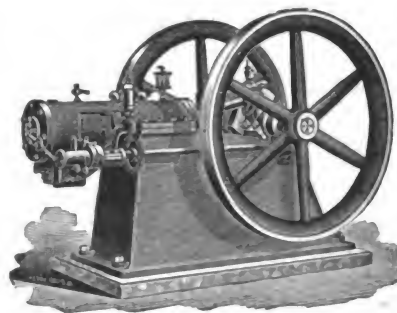
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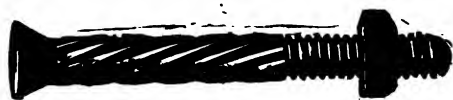


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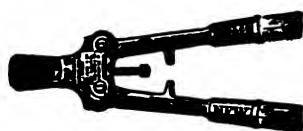
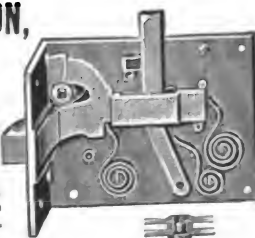
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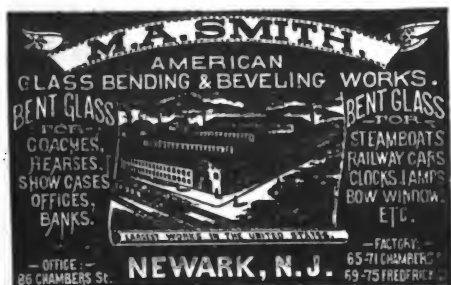


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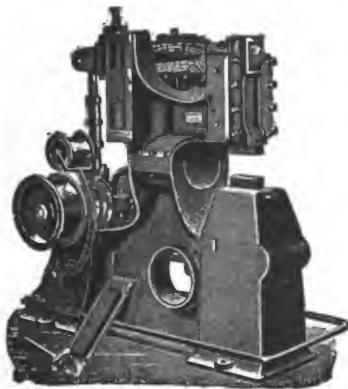
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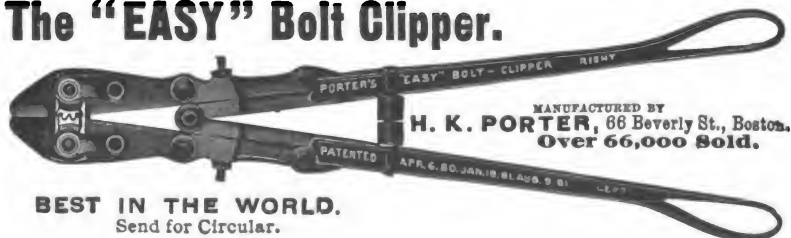
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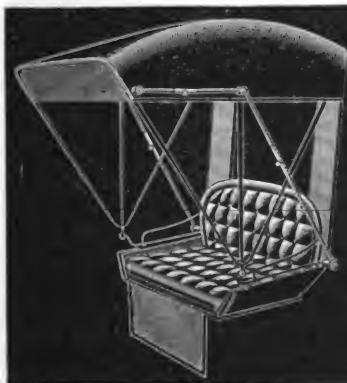
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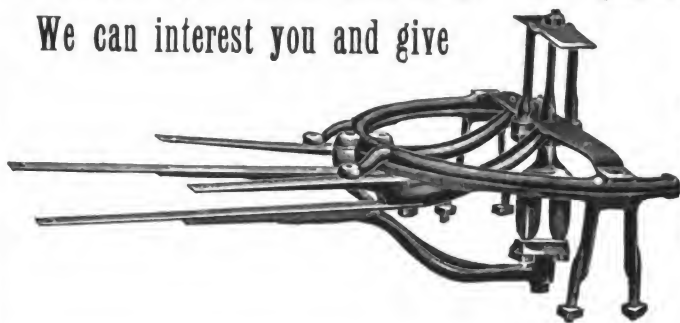
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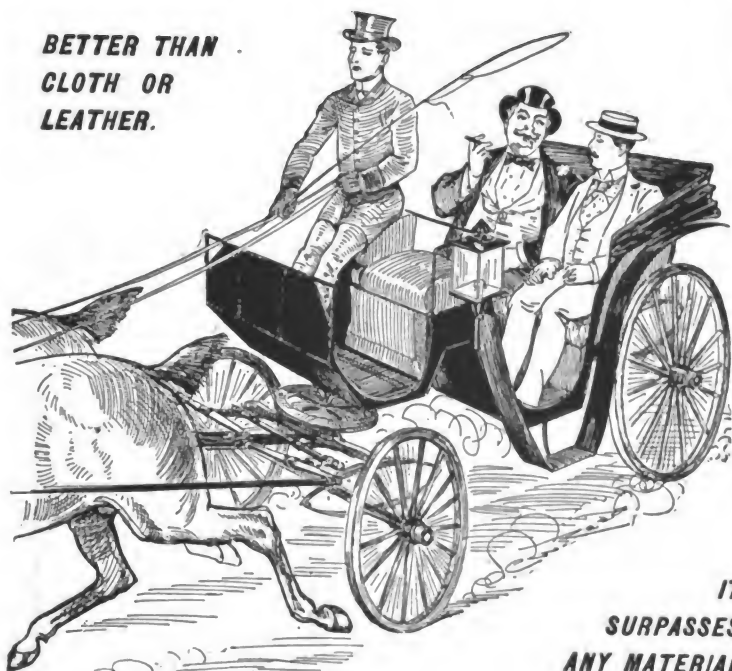
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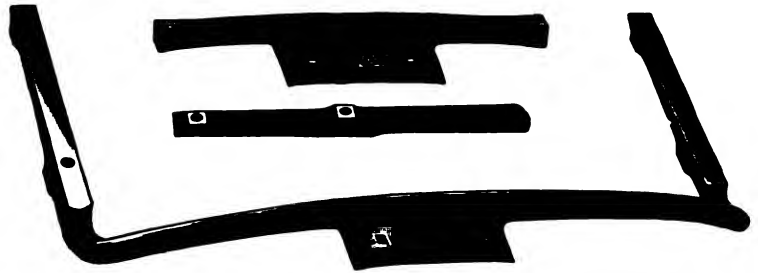
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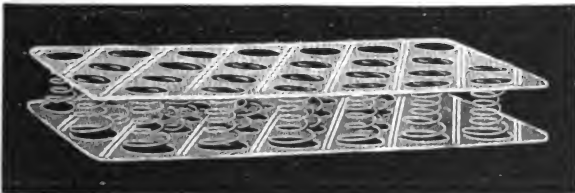
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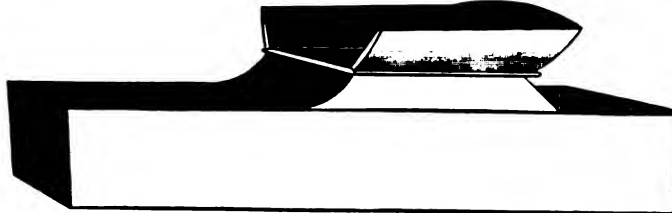


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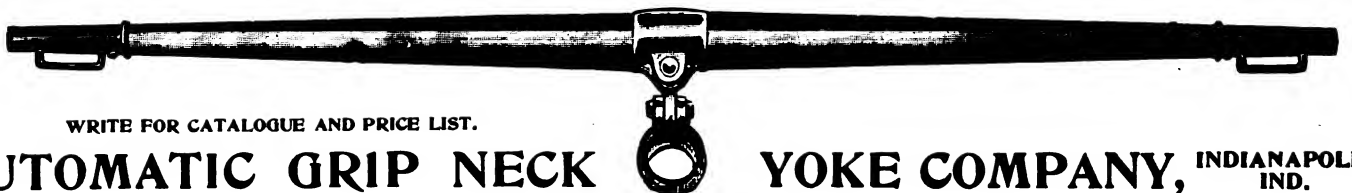
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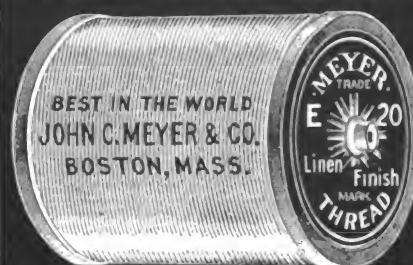
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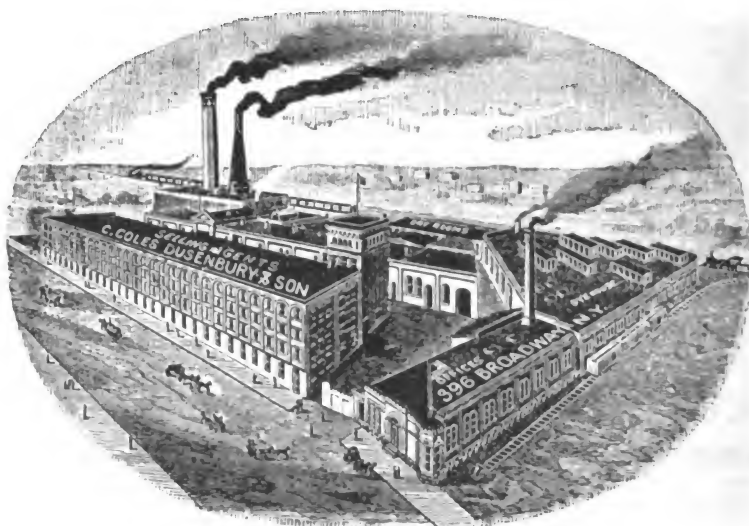
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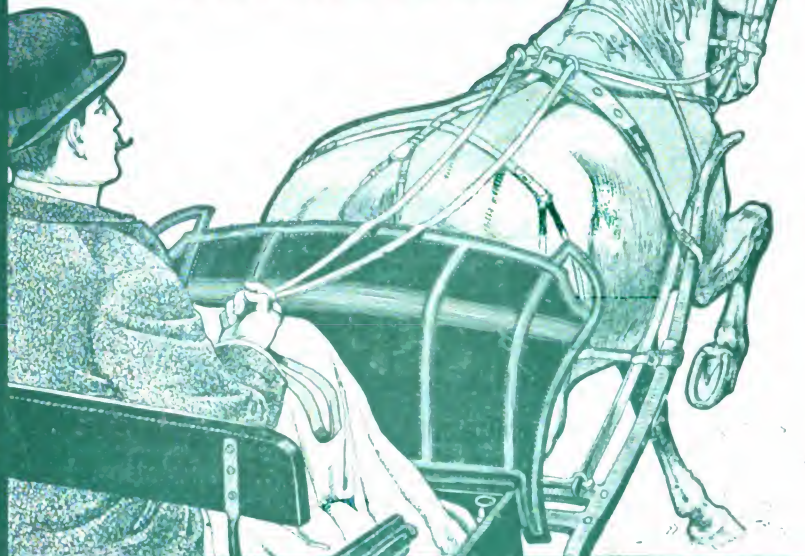


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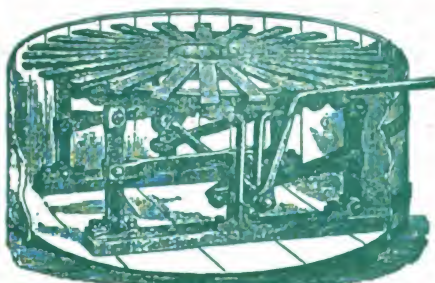
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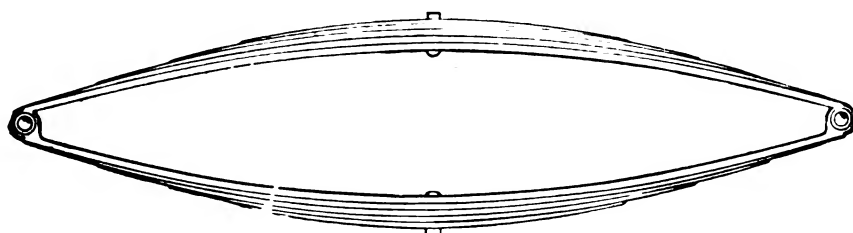
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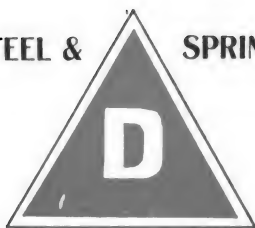
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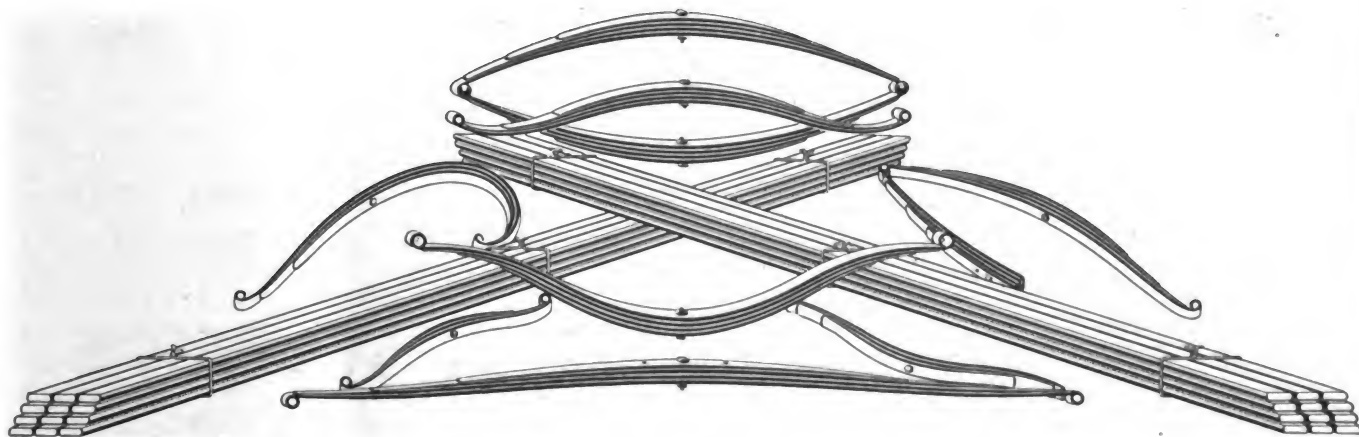


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THERE will be 20,000 BIKE WAGONS built and sold in 1900. One-half of these will be high-grade work, equipped with first-class guaranteed tires. The balance will be medium-grade work, equipped with light construction, low-grade tires, unbranded, or branded with a single name backed up by a supposed guarantee, printed on a slip of paper, pasted on seat of wagon, the provisions of which read: Not responsible for punctures, stone bruises, rim cutting, etc. The above clause represents 95 per cent. of all troubles, consequently guarantee is misleading. High-grade, heavily constructed tires withstand these troubles, although rim cutting is entirely the fault of the driver. The tire is either not inflated sufficiently, or leaks for one cause or another, and should be attended to immediately. We are making only the Diamond Single Tube Pneumatic Carriage Tires, bearing brand like cut shown. We know this tire is made with a knowledge of the demands, and we are prepared to back it up regardless of expense.



Made in Akron, Ohio, by

THE DIAMOND RUBBER CO.

Please mention "The Hub" when you write.

The Hub

"RED SEAL" COACH AND CAR COLORS

ARE ABSOLUTELY THE FINEST MADE.



WE take pleasure in furnishing samples of the colors we make, so that the consumer may be convinced of the richness and tone of our colors before purchasing.



DETROIT WHITE LEAD WORKS, DETROIT. CHICAGO.
BUFFALO. MEMPHIS.

WHY USE SANDPAPER?

1. When you can get the same results in just **ONE-HALF THE TIME** by using Steel Wool?
2. When you can save just **ONE-HALF** the labor by using Steel Wool?
3. When you can do the same job **MORE EASILY** by using Steel Wool?

USE
BUY
TRY

STEEL WOOL.

It cuts more quickly and more uniformly than sandpaper, does not clog or "gum up," and adapts itself readily to the shape of carvings, mouldings, etc., etc.

Steel Wool is very light, but exceedingly durable, and in corners or cornices, and on mouldings where sandpaper is used only with the greatest difficulty, labor and expense of time, Steel Wool does the work easily, with little labor, and in just one-half the time. Special Discounts to Consumers for Large Quantities. Write for Quotations.

BUHNE STEEL WOOL CO.,
15 Dev Street NEW YORK.

W. F. FULLER & CO., Pacific Coast Agents, - San Francisco.
GEO. E. WATSON CO., Chicago Agents,
38 Randolph Street, Chicago.

DON'T CONDEMN YOUR GOODS WITH POOR ILLUSTRATIONS.

YOU CAN INCREASE YOUR SALES BY CORRECTLY ILLUSTRATING YOUR LINE.

The Road to Wealth.

THE MOST IMPORTANT THING CONTRIBUTING TO THE SUCCESS OF YOUR BUSINESS IS A CORRECT AND

UP-TO-DATE CATALOG

MADE ONLY BY

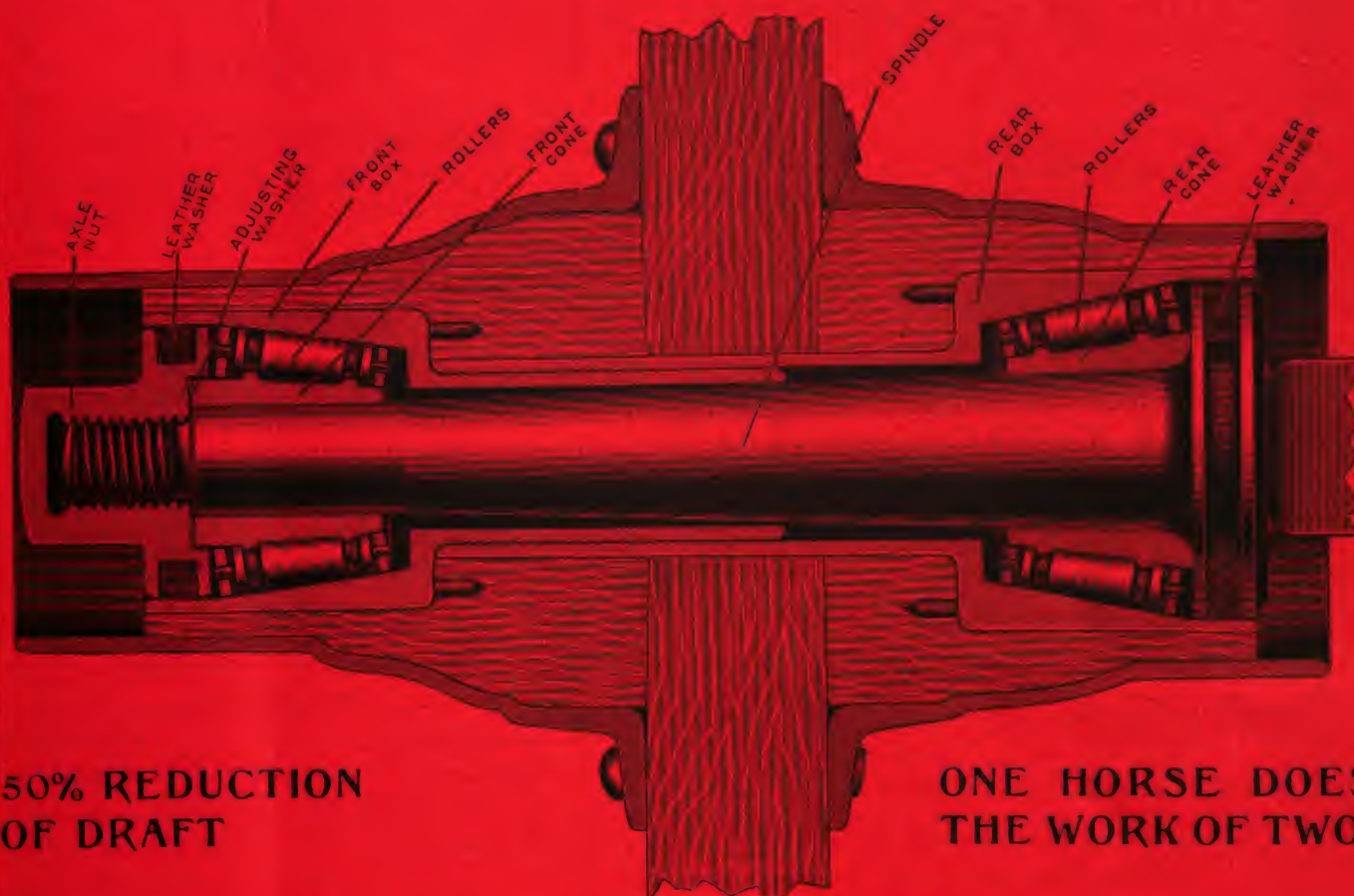
GRAND RAPIDS ENGRAVING CO.,
GRAND RAPIDS, MICH.

SEND FOR SAMPLES.

MODERN CARRIAGE ENGRAVERS AND PRINTERS.

Please mention "The Hub" when you write.

TIMKEN ROLLER BEARING AXLE



50% REDUCTION
OF DRAFT

ONE HORSE DOES
THE WORK OF TWO.

Patents, 606,635, June 28th, 1898. No. 606,636, June 28th, 1898.

INSTRUCTIONS FOR PUTTING WHEELS ON:

*Slip rear cone on spindle,
Put wheel on,
Slip front cone on spindle,
Screw up axle nut tight,
Drive off.*

Simple, isn't it?



REAR CONE AND ROLLERS

SEND FOR CATALOGUE.

TIMKEN ROLLER BEARING AXLE CO.

HENRY TIMKEN, President,

2d and Branch Streets,

ST. LOUIS, MO.

Please mention "The Hub" when you write.

No Complaints



come to the manufacturer whose work is finished with our

Twentieth Century Gear.

The materials from which it is made are so uniform, and the manner of its making is so simple that it is always the same; one barrel is exactly like another.

It works as easily as oil.
Dries good and hard.
Wears well.
And has a luster that pleases
The Builder,
The Dealer,
The Consumer.

If you need a gear varnish like this, let us send you a five gallon can. "The proof of the pudding is in the eating thereof."

LILLY VARNISH CO.,
Indianapolis, Ind.

A DESIRABLE RED GLAZING COLOR.

HARRISONS'
COACH PAINTERS'
PERMANENT RED GLAZE.

Desirable because:—

It is one-fourth the price of French Carmine and in point of permanency and durability is far superior to it.

HARRISON BROS. & CO., Inc.,
White Lead, Colors, Paints, Varnishes & Chemicals.
35TH AND GRAYS FERRY ROAD,
PHILADELPHIA.
117 FULTON STREET, NEW YORK. 27 LAKE STREET, CHICAGO.

Painted Surfaces on Vehicles
receive

HARD USAGE.

A smooth, brilliant coating, durable both as to color and material, can only be obtained with ZINC WHITE, or combinations based on ZINC WHITE.

THE NEW JERSEY ZINC CO.,

71 Broadway,

FREE: Our Pamphlets: NEW YORK CITY.
"The Paint Question."
"Paints in Architecture."

Carriage Painters

Do You Know Us?

Do You Know Our Product?



What do You Think of It?

Have You Given It a Trial?



HAVE you seen our new Catalogue G, and are you familiar with the line of Panel Ornamentation that we are supplying to the trade? Do you know that it is to your interest to keep in touch with us? We are getting up new schemes for Ornamentation constantly, and what we get up are new and not the old, antiquated, out of date, 50 years behind the times, ridiculously mixed up style of colors, formerly furnished by the foreign importers. Our designs are new and up to date, as well as original style of ornamentation. It is foolish for you to spend fifty cents or a dollar for decorating that can be done for 15 per cent. or 20 per cent. of that cost and can be done much better at that.

Do not assume that we are trying to sell you these old styles. Do not take anything for granted. Write us for our catalogues and samples, which are free for the asking. We not only have these panels but other work of that character, as well as delicate scroll ornamentation, such as you see on the highest grade vehicles. Does it not appeal to your reason that when twelve short months ago we were not known in the field, and in that short period we have worked up a business of \$100,000 per year, there must be merit in the product?

Orders for special designs, whether for the vehicle or any other industry, receive prompt attention.



THE MEYERCORD CO., INC.,

American Manufacturers

Guaranteed Decalcomania Transfers.

**NEW YORK OFFICE,
805 St. James Building.**

**MAIN OFFICE, Chamber of Commerce,
CHICAGO.**

THE PAINT SHOP



Regulates the daily output of your factory. No matter how many ingenious devices you may have for facilitating work in other departments, they avail you nothing when the Paint Department is reached—the place where you first inquire when an order is overdue for shipment, and your customer growing impatient.

You may crowd the painting some, but you do it at a risk—not only of your reputation as good painters, but of further delay through inferior results attained—and the ultimate loss of the order itself.

THE KNOX SYSTEM OF GARRIAGE PAINTING....



Is a great help in any paint shop. It is quicker than the old way—and less expensive, because it requires fewer coats and less labor.

It is also more DURABLE, because each coat is elastic, hence no flat coats to flake, scale or peel. Our combined booklet and color card will be mailed gratuitously upon request. It tells how to use our Primers, Fillers, Surfacer and Roughstuffs, and explains the importance of our line of Superfine Coach Colors for use in connection.

THE KNOX SYSTEM

MFGRS. OF PAINTS AND COLORS.

TROY, OHIO, U.S.A. 

A Good Black
 at a low price is a very difficult article to get. We have one in our
"Monogram Drop"
 put up in 5 or 10 pound press cans, like cut, at
16cts. per pound, net.
 Also Colors, Brushes, Pumice Stone, Rubbing and Rotten Stone, Sponges, Chamois, Rubbing Felts.
 GENERAL WESTERN AGENTS FOR
BUEHNE'S STEEL WOOL
 Takes place of Sandpaper and Pumice. Samples and Price List for the asking.

BRUSHES.

We make a specialty of Brushes for Carriage and Wagon Makers.

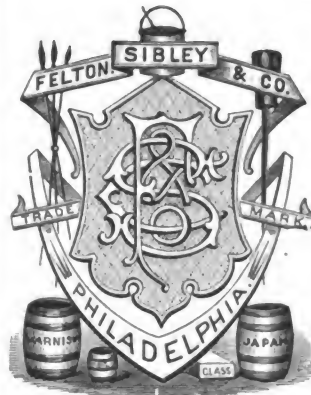
Send for our Net Price List of Carriage Painters' Materials and Supplies mailed on application.

GEO. E. WATSON CO.,
 Paints, Oils, Varnishes, Brushes, Painters' Supplies and Artists' Materials, Carriage Painters' Specialties.
 38 EAST RANDOLPH STREET, CHICAGO.
 Wholesale Agents for Eureka Rubbing Stone.

Varnish Troubles

and Color Kinks.

May be avoided by using the best goods on the market.



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FELTON, SIBLEY & CO.,

Makers of High Grade Varnishes and Superfine Colors.

136-140 North 4th Street,
 PHILADELPHIA.

THE JEWETT 4 and 5.

Model of...
 1900



Revelations in Modern Typewriter Machines used the World over.....

WRITE FOR ART CATALOGUE.

JEWETT TYPEWRITER CO., Des Moines, Iowa.
 New York Office, 200 Broadway.

Filling-up Specialties and How to Use Them.



This little book should be in the hands of every foreman carriage painter and of every person employed in a carriage paint shop. It states concisely the best way to produce the best surface with the greatest economy in time and materials. It covers the subject from the bare wood to the first coat of varnish. Send postal for copy, which will be mailed free, and at the same time ask for samples (on wood) of my Special Colors.

C. A. WILLEY, HUNTER'S POINT, NEW YORK CITY.

Twenty years' experience as a Foreman Coach and Carriage Painter.

EXPORT TRADE!

DOES IT INTEREST YOU? ARE YOU LOOKING FOR IT?

If so you should have a card in **THE HUB**, as it has subscribers in every country in the world where carriages are used. Write for our card of rates.

TRADE NEWS PUBLISHING CO., 24-26 Murray Street, New York.

Please mention "The Hub" when you write.

THE

SOLE AGENTS IN U. S. FOR
NOBLES & HOARE'S
—FAMOUS—
ENGLISH VARNISHES

Japan Gold Size,
Rough Stuff
* DRY AND READY MIXED.

POMEROY & FISHER, NEW YORK
28 & 30 FRANKFURT STREET.

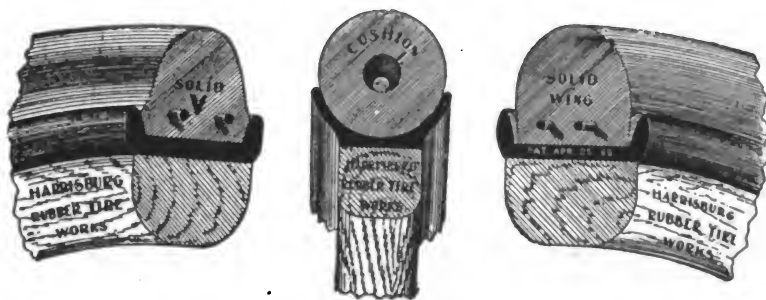
IMPORTERS
OF THE BEST
English
WHITE LEAD
ESPECIALLY SUITED FOR
CARRIAGE WORK.
Genuine English Vermillions,
Cadmium and Perfect Yellows,
and other Fine Coach Colors.
Japan Colors, Bronze Powders, Etc.

BEST **OF**

EVERY-THING

HARRISBURG RUBBER TIRE WORKS,

HARRISBURG, PA.



KELLY—SPRINGFIELD—GOODYEAR
AND ALL PATTERNS OF HIGH
GRADE TIRES. * * * *

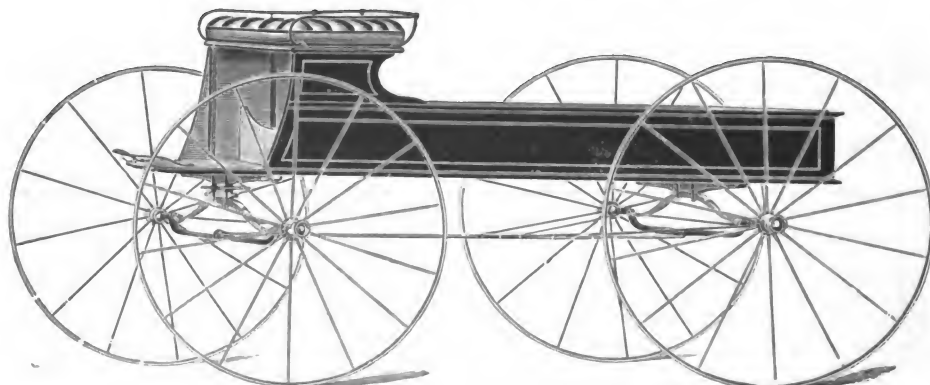
ALL PATTERNS WOOD WHEELS.

*Special attention given to the assembling of tires
on finished wheels.*

AUTOMOBILE BODIES IN THE WHITE, OR PAINTED
AND TRIMMED.

SEND FOR QUOTATIONS.

HOMER WAGON CO., Homer. N. Y., U. S. A.



No. 100. VILLAGE GROCERY WAGON.

BUILDERS OF HIGH GRADE

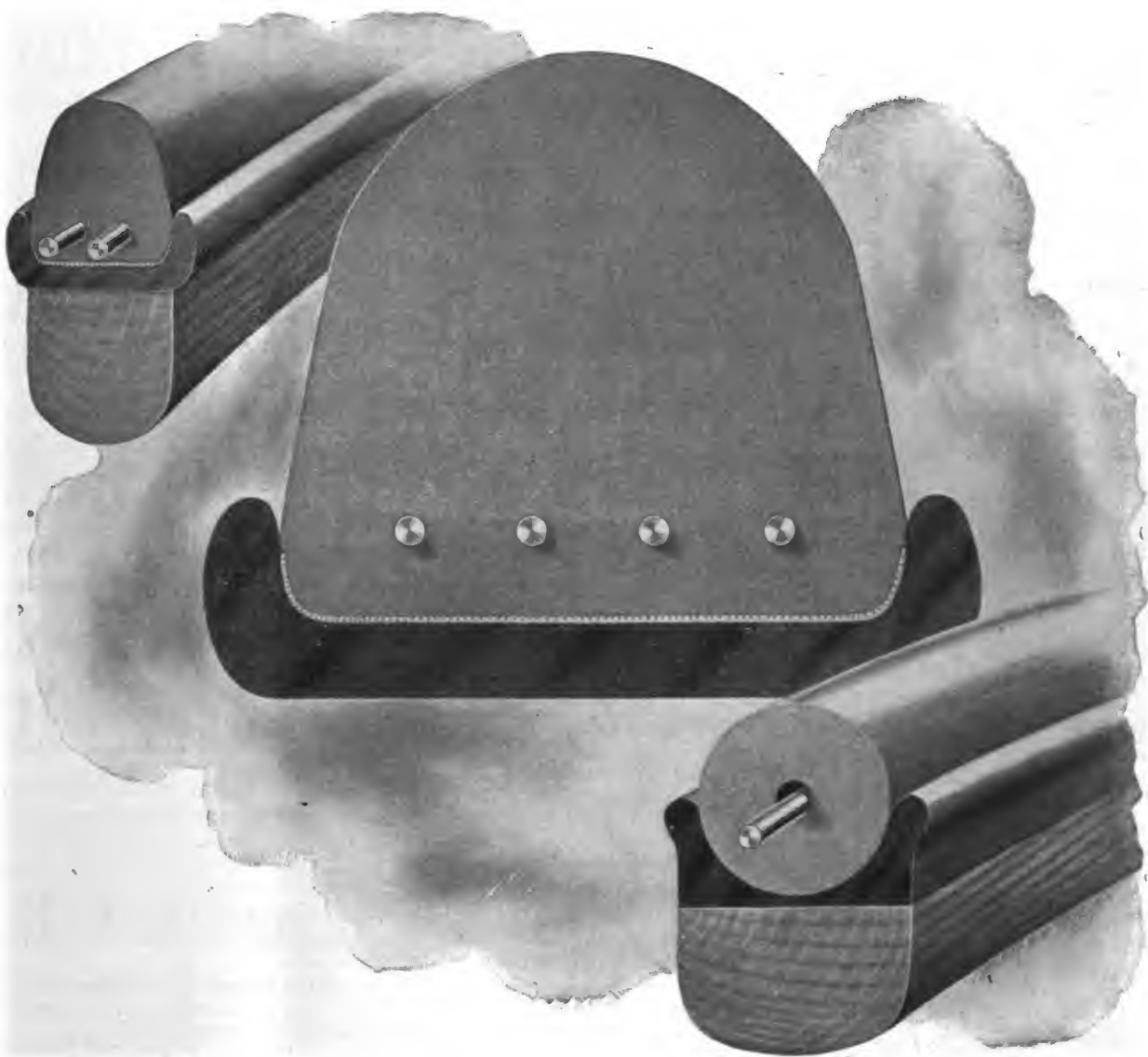
**RUNABOUTS,
PNEUMATIC SURREYS,
BUSINESS WAGONS,
MILK AND DELIVERY
WAGONS**

OUR No. 100 VILLAGE GROCERY WAGON:

Body, 7 feet long, 3 feet wide ; axles, 1 1/4 inch ;
tires, 1 inch ; Sarven wheels ; drop end
gate ; short turn fifth wheel. Painting :
Body, carmine or green ; gear, yellow.
Price, with shafts.

Please mention "The Hub" when you write.

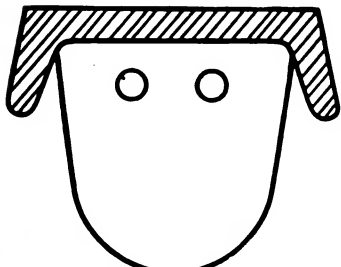
KELLY SPRINGFIELD ...TIRES...



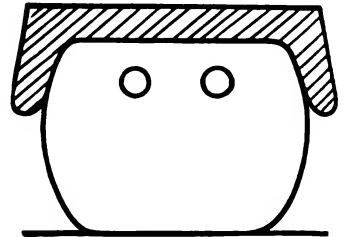
Consolidated Rubber Tire Co.

Langmuir's Patent Improved Solid Rubber

CARRIAGE TIRE



NORMAL



UNDER LOAD

This tire does not open at the joint and consequently it does not require compression; does not creep; does not cut out at the base; does not split or scalp; all on account of the V-shaped space between the tire and the flanges. We supply the trade with all sizes from $\frac{3}{4}$ to 2 inches inclusive. We furnish a complete outfit for applying all sizes, $\frac{3}{4}$ to 2 inches.

PUT THEM ON IN YOUR SHOP IN THE REGULAR CHANNEL IRON IN USE

REVERE RUBBER CO.

Sole Manufacturers, 59 & 61 Reade St., New York

A Pneumatic Tire without a valve or lugs

THE material that goes into this tire is as durable and strong as that in any tire made. It is made of a close woven fabric of the best Sea Island cotton; the tube and cover of the best Para rubber. This construction assures a practically punctureless tire and one of the greatest resiliency and wearing qualities.

The absence of a **VALVE** means that **VALVE STEMS, BOLTS** and **LUGS** are dispensed with and that there is no danger of leaking around the **VALVE STEM** or **LUGS** because there are none.

This tire is so constructed that it is inflated by inserting a hollow needle at a plainly marked point in the center of the tread. To the base of this needle is attached an ordinary air pump, with which the tire is inflated in the usual manner.

At the point marked for the insertion of the needle there is manufactured into the tire a concealed pocket filled with a pasty, gummy mass. The needle penetrates through this into the air chamber. When the needle is withdrawn this mass acts as a valve and effectually closes up, air-tight, the puncture made by the needle.

This tire is practical—has been proven so by several years of testing and actual use. It is made regularly in four sizes—34, 36, 38 and 40 x $1\frac{1}{2}$ inches, although we can manufacture any size to order. Complete information as to construction and manufacture is set forth in our illustrated catalog, which we will mail you on request.

"THE CLARK CYCLE TIRE CO., Equitable Bldg., **Sole Manufacturers** **Clark Valveless."**
BOSTON, MASS., OF THE

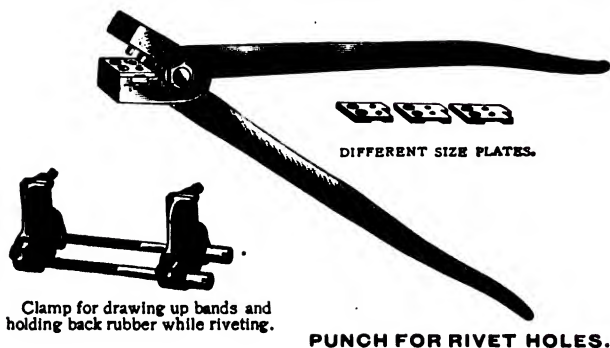
MORGAN & WRIGHT TIRES
ARE GOOD TIRES

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

THE
MORGAN & WRIGHT
SOLID
RUBBER
VEHICLE
TIRES



Are Fastened In the Channel by Means of a Steel Band.

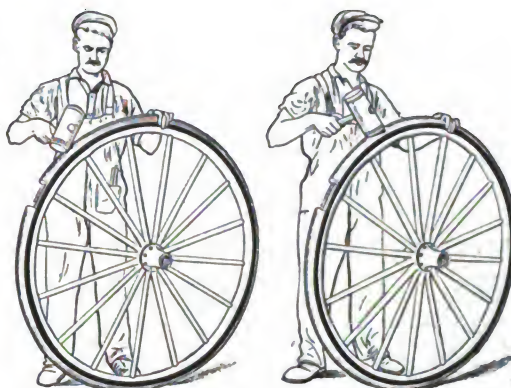


DIFFERENT SIZE PLATES.

PUNCH FOR RIVET HOLES.

With this set of tools (which we furnish at nominal cost) and an ordinary vise, any mechanic can fasten them on.

We furnish channels, tires and tools complete.



No. 1.

No. 2.

Cut No. 1 shows the RIGHT way to pound a solid Rubber Vehicle Tire to bring the two ends together after it has been fastened in the rim. Cut No. 2 shows the WRONG way. ALWAYS strike a GLANCING blow, as shown in Cut 1, and NEVER strike a STRAIGHT blow, as shown in Cut 2.



We also make the Cactus Carriage and Pneumatic Carriage Tires in all sizes and diameters. Full information regarding our tires sent on request.



NEW YORK BRANCH:
214-216 W. 47th Street.

MORGAN & WRIGHT
331 WEST LAKE STREET
CHICAGO.

BOSTON BRANCH:
80 Batterymarch Street.
Near Fort Hill Square.

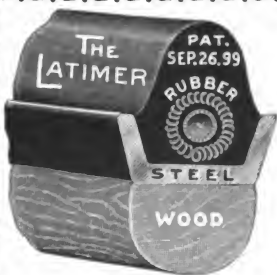
MORGAN & WRIGHT TIRES
ARE GOOD TIRES

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

WE MANUFACTURE
**PROP BLOCK RUBBER, BOOT STRAPS,
 CORRUGATED MATTING,
 VEHICLE TIRES,**
**Mechanical and Special Moulded
 Rubber Goods.**

WRITE FOR CATALOGUE AND PRICES.

THE WHITMAN & BARNES MFG. CO.,
 General Office and Rubber Factory,
AKRON, OHIO.



RESILIENT
 COMPOUND STEEL SPRING
VEHICLE TIRES.



After a test of one year and a half we are pleased to place this Tire before the people. This Tire will take the place of pneumatic tires for vehicles as well as solid rubber tires. It is more resilient than solid rubber, therefore will stand more wear. It will not crack off at the top of the channel like solid rubber tires, as the Compound Steel Springs will keep the rubber from cracking at that point. The two coils of wire are in telescopic (or tubular) engagement with each other and embedded in a body of rubber at a very high pressure, so as to form a solid mass of rubber and springs. We use one wire to fasten the tire to the channel which runs through centre hole. The ends of wire are brazed and the wire drawn tight on bottom of coiled spring gives wide bearing footing and makes it impossible for tire to rock.



WIRE PULLER.

With this Puller, which we furnish, a Blow Torch and Vise, any ordinary mechanic can set our tires.

**THE LATIMER RUBBER
 TIRE CO.**



CHICAGO,
 24 South Clinton Street.

NEW YORK,
 15 Platt Street.

WORKS, HUNTLEY, ILL.



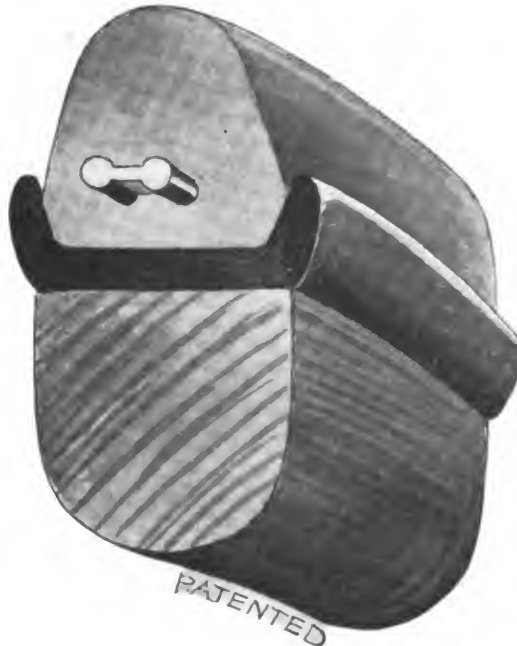
Please mention "The Hub" when you write.

CALUMET TIRE RUBBER CO.

*This Retaining Band
allows no*

*LATERAL
or RADIAL
CUTTING*

from inside of tire.

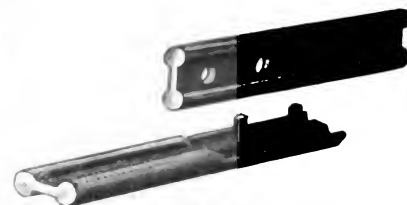


*It locks
itself in
place.*



PATENT APPLIED FOR.

*Tires
attached
with this
machine in
HALF the
usual time.*



PATENT APPLIED FOR.

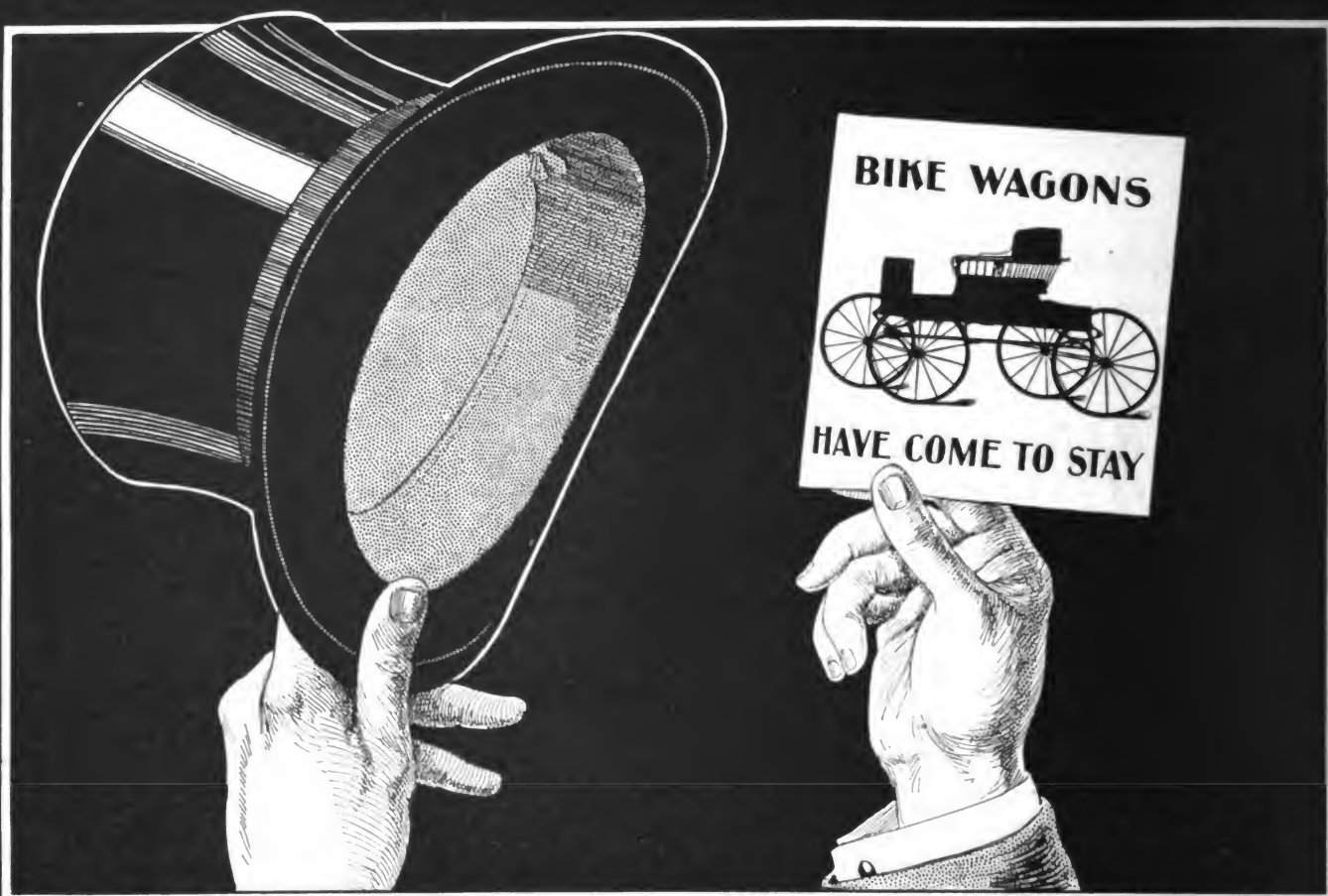
*A fastening device
more efficient than
Brazing or welding.*



FOR CATALOGUE AND FURTHER
INFORMATION SEND TO

CALUMET TIRE RUBBER CO.

116 to 128 North Lincoln Street, CHICAGO, ILL.



BIKE WAGONS HAVE COME TO STAY.

(CUT THIS OUT AND PASTE IT IN YOUR HAT.)

In case you may have any lingering doubt on this subject we'll tell you why they have come to stay.

The principle of the Bike Wagon, as we make it, is a vast improvement on the old style buggy, both as regards convenience and durability.

You can get in and out easier, and can turn a great deal shorter.

There are no bed pieces, and very little wood to shrink and no wood spring bars with old style body loops and attachments, which are sure to twist out of shape.

In fact, the Bike Wagon is the ideal piano box buggy. We were the first to build them on a large scale, and by making a specialty of this style of vehicle we are able to furnish a superior job at the very lowest cost.

Remember, we sell in the white for less than others can build from the plank.


And you can *CUT THIS OUT AND PASTE IT IN YOUR HAT*, and when you have thoroughly absorbed it, send us an order.

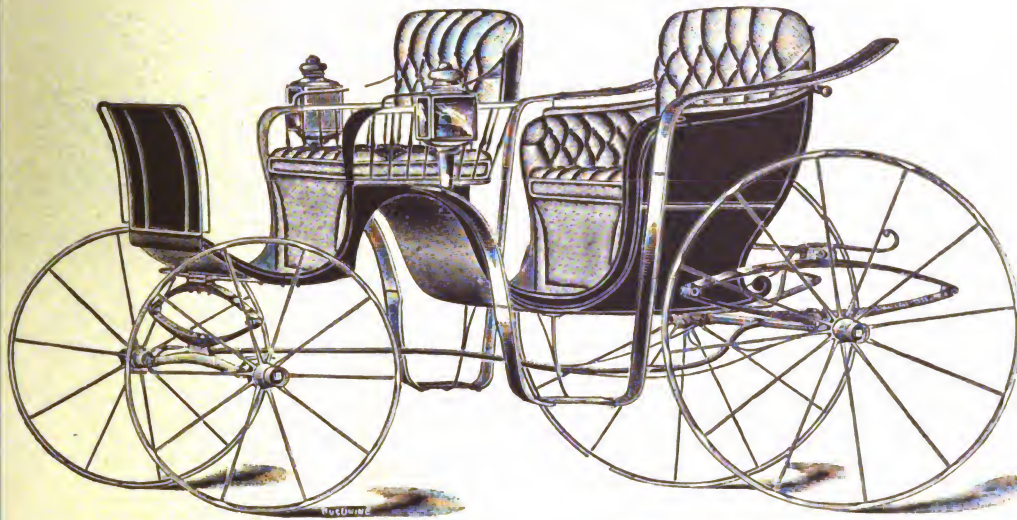
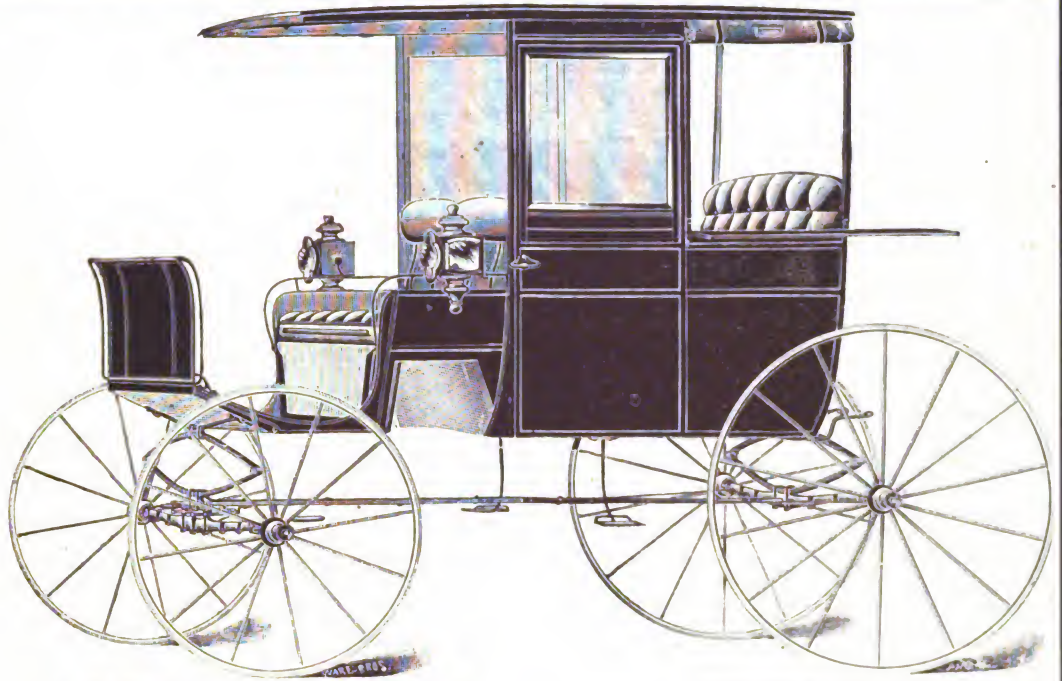


THE BUFFALO SPRING & GEAR CO.,

BUFFALO, N. Y.

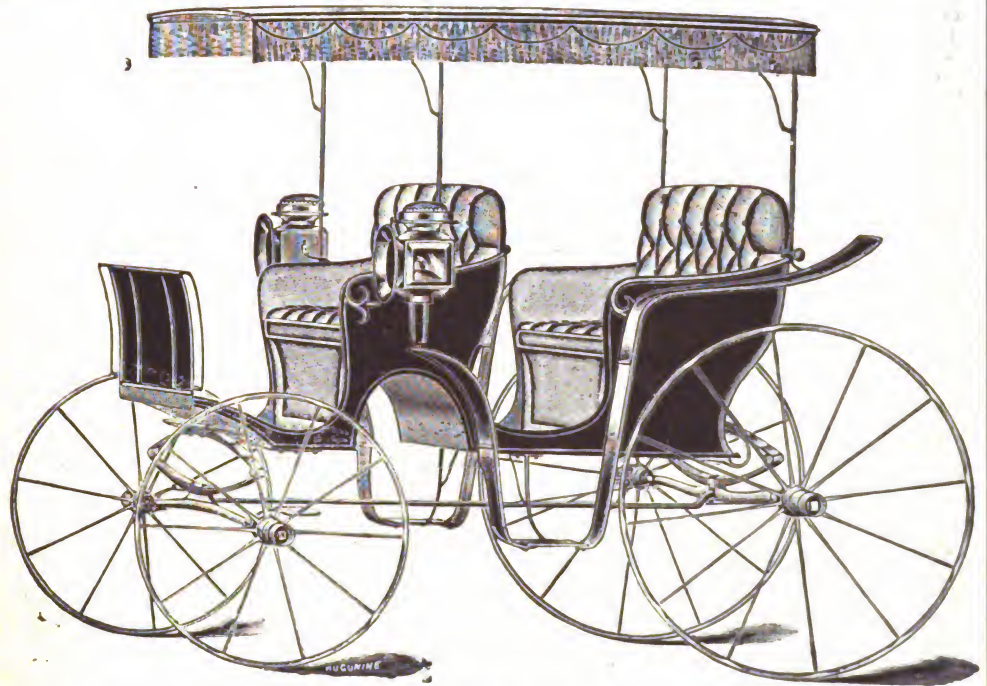
SEND FOR PRICE LIST AND DISCOUNT.

H. H. 
**BABCOCK
COMPANY.**



WOULD LIKE TO
SEND THEIR NEW
CATALOGUE TO
ALL DEALERS
WHO HAVE NOT
RECEIVED ONE.

WHEN YOU SELL
A BABCOCK VE-
HICLE YOU ARE
ALWAYS SURE
OF PLEASING
YOUR CUSTOM-
ER. * * * *



H. H. BABCOCK COMPANY, Fine Carriage Builders,
WATERTOWN, N. Y.

Please mention "The Hub" when you write.

Pneumatics.

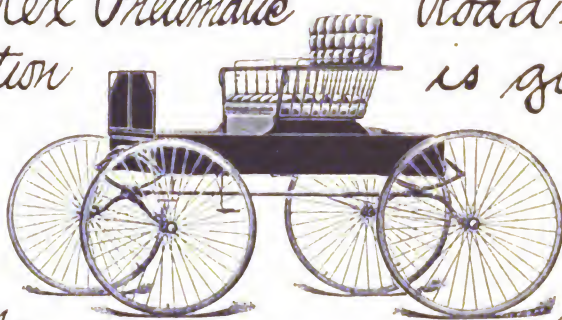
To The Trade;—

The subject of "Pneumatics" has commanded the earnest attention of progressive carriage builders and dealers during the past season to a remarkable degree.

The conclusion reached by both is that, to be a permanent success, Pneumatic Vehicles must be constructed of the best material, honestly put together.

It is just this combination that we are offering to the dealer who appreciates a good looker, a good seller and a good laster in a Pneumatic.

In The Rex Pneumatic Road Wagon, shown herewith full appreciation of first impressions its unusually pleasing proportion this is the recognition lying principle that lasting friendship is, above all, due to good wearing qualities — nothing but the very best of material is used in any part of this vehicle and it is sold on this guarantee.

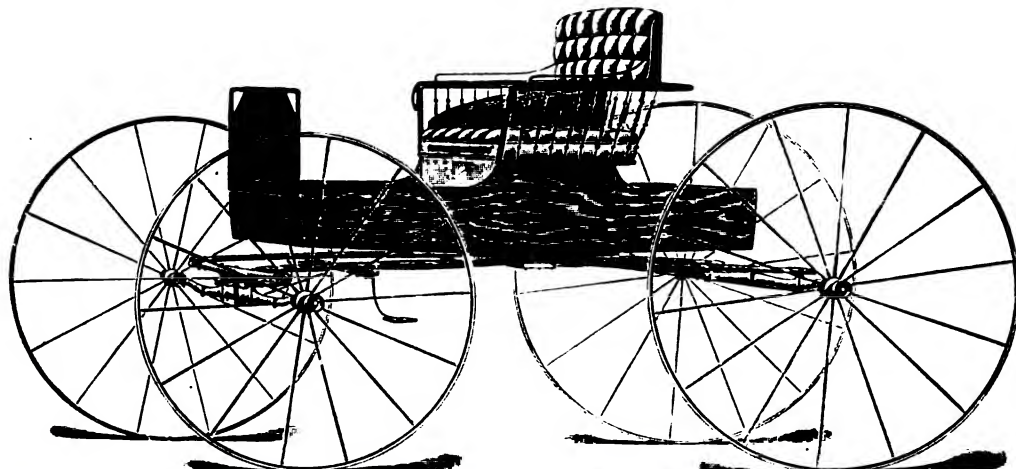


Its price, quality considered, is also very attractive, and we solicit correspondence from prospective buyers believing that the intrinsic merit in the "Rex" will win.

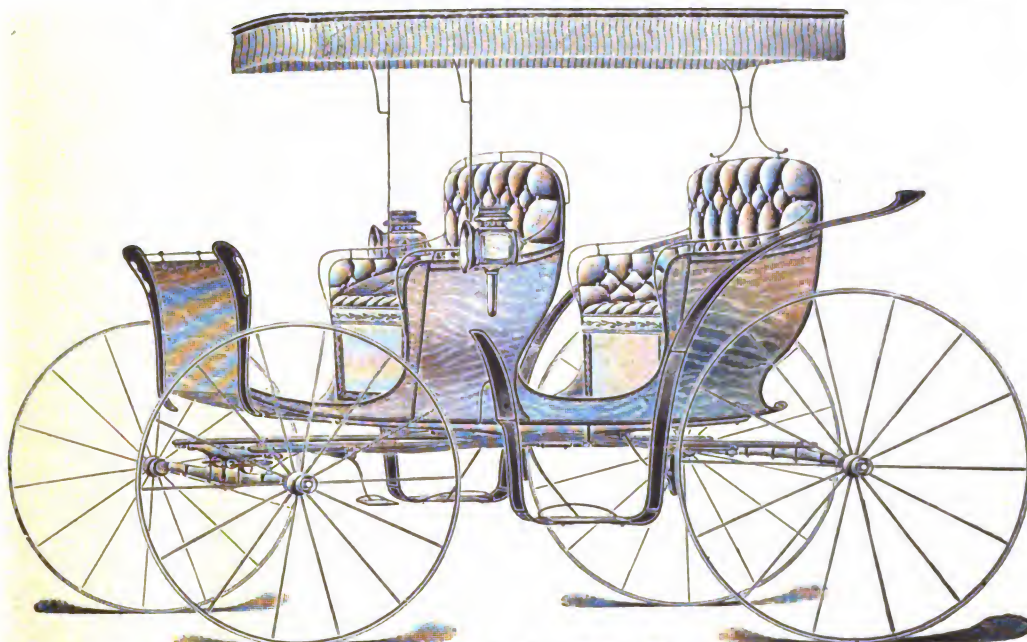
Waterloo Wagon Company Ltd.

Waterloo, N.Y.

In the Construction of Our
GLENS FALLS BUCKBOARD VEHICLES



No. 430. NEWPORT ROAD WAGON BUCKBOARD.—Glens Falls Gear.



No. 445. CARLSBAD CURRICLE BUCKBOARD.—Glens Falls Gear.

WE AIM:

First - - AT DESIGN. Our designs are prepared with an eye to artistic proportion, combined with comfort.

Second - - AT QUALITY OF MATERIAL. We use nothing therein that is not of the Very Highest Grade.

Third - - AT WORKMANSHIP. We employ in their construction none but the highest class of workmen, experienced in Buckboard building.

Fourth - - AT FINISH. We finish these Vehicles in such a manner that they are not only beautiful when new, but they will grow old gracefully, taking on with age those rich tones and colorings so pleasing to the artistic eye.

Fifth - - AT EQUIPMENT. Judged by the most critical and exacting standards, our equipment for comfort and convenience is complete in every detail.

Sixth - - AT PRICE. Our price is as low as it is possible to offer an absolutely high grade Buckboard.

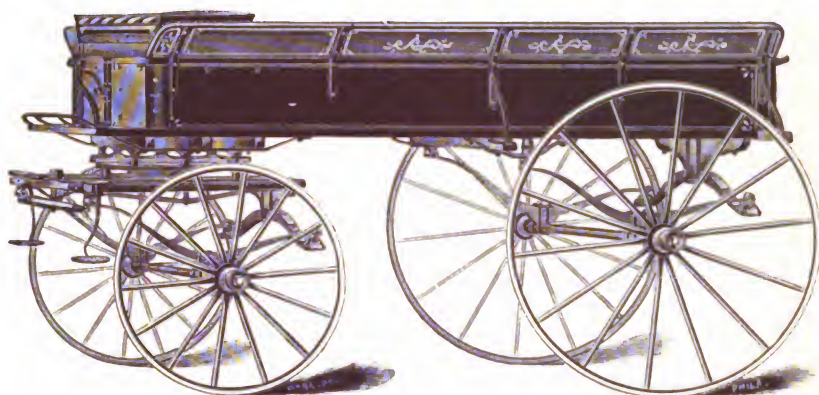
Correspondence Solicited.

WATERLOO WAGON CO., Limited,
WATERLOO, SENECA COUNTY, N. Y., U. S. A.

Please mention "The Hub" when you write.

Hoover Wagons

ONLY FIRST-CLASS MATERIALS USED IN THEIR CONSTRUCTION.



No. 34. "HOOVER" WHOLESALE BUTCHERS' MEAT WAGON.

*Express and Delivery
Wagons of all kinds.*

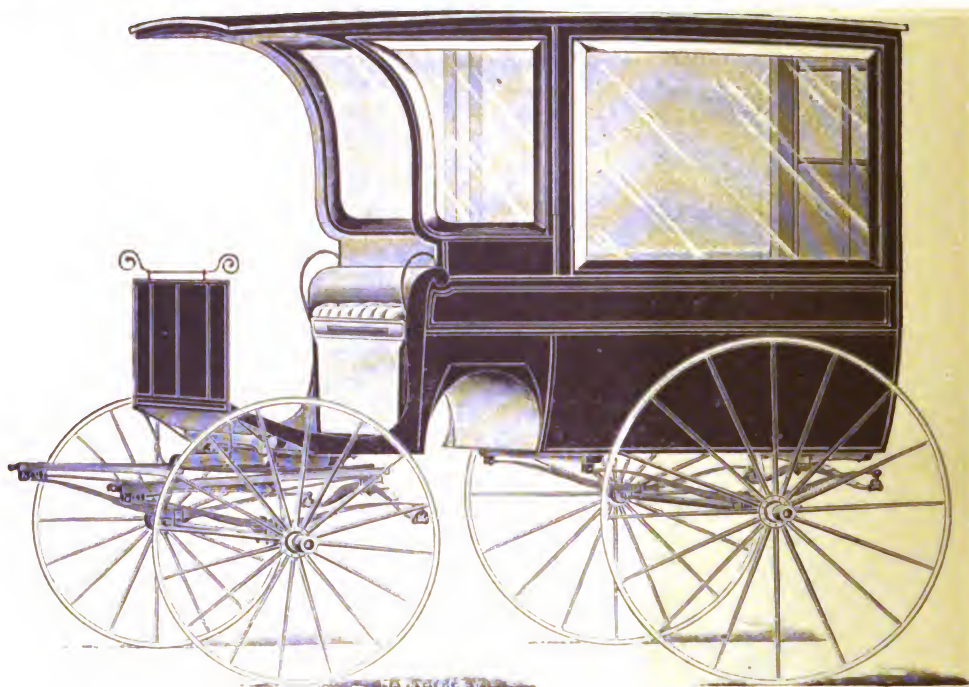


**EXPORT TRADE
SOLICITED.**

*Honest Made
Buggies and
other Pleasure
Vehicles.*



**SPECIAL WAGONS
BUILT TO ORDER.**



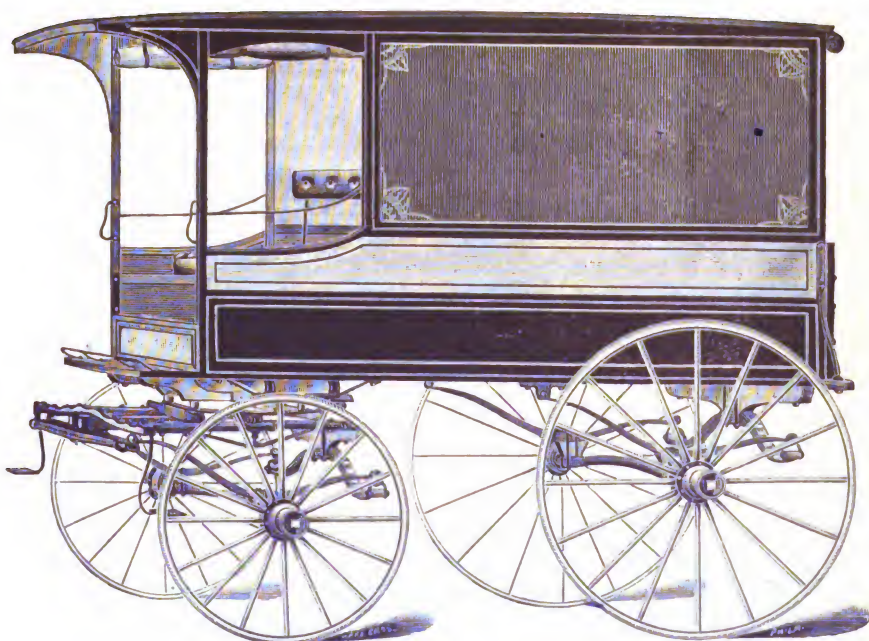
No. 17. "HOOVER" GLASS SIDE DELIVERY WAGON.

These Wagons are manufactured
for the trade only, by the

Hoover Wagon Co.,

Successors to G. W. HOOVER & SONS,

York, Pa.



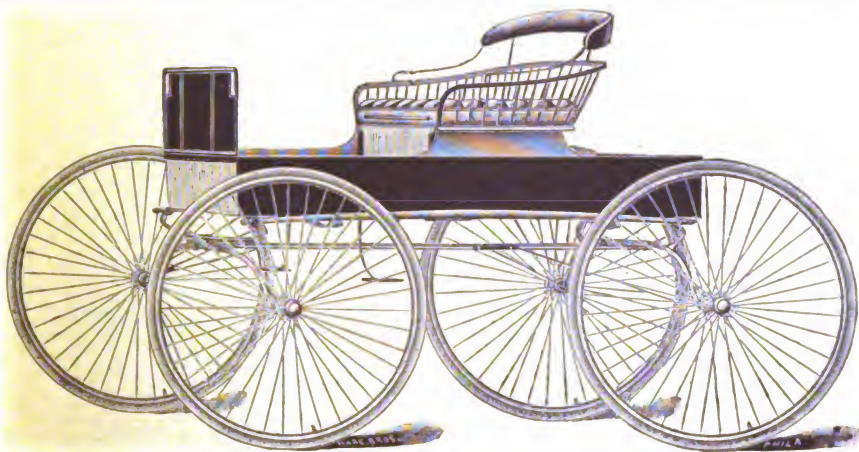
"HOOVER" NEW YORK STANDARD DELIVERY WAGON.

Please mention "The Hub" when you write.

WANTED

Live, Up-to-Date Dealers to Handle

THE BEST LINE OF **WAGONS** MANUFACTURED.

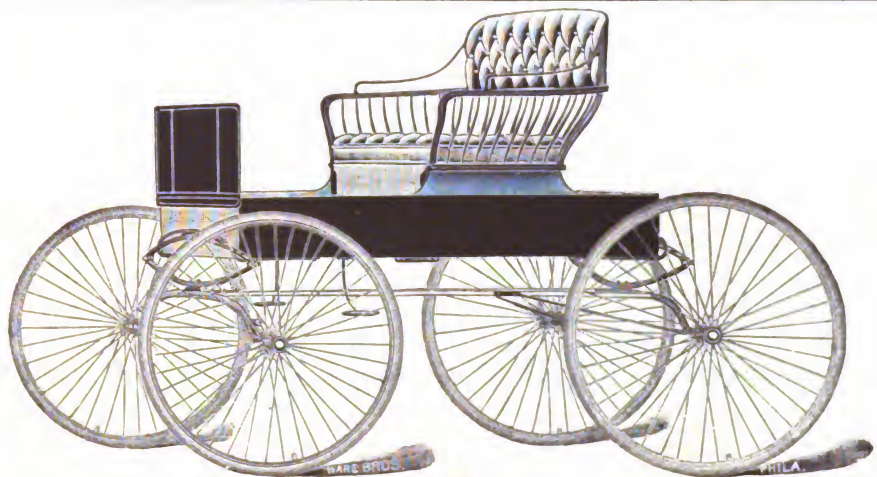


No. 50.

Gentlemen's Light Road Wagon or Speeder.



☞ **THE STIVERS GEAR A SPECIALTY.** ☞



No. 80.

End Spring Pneumatic Runabout.

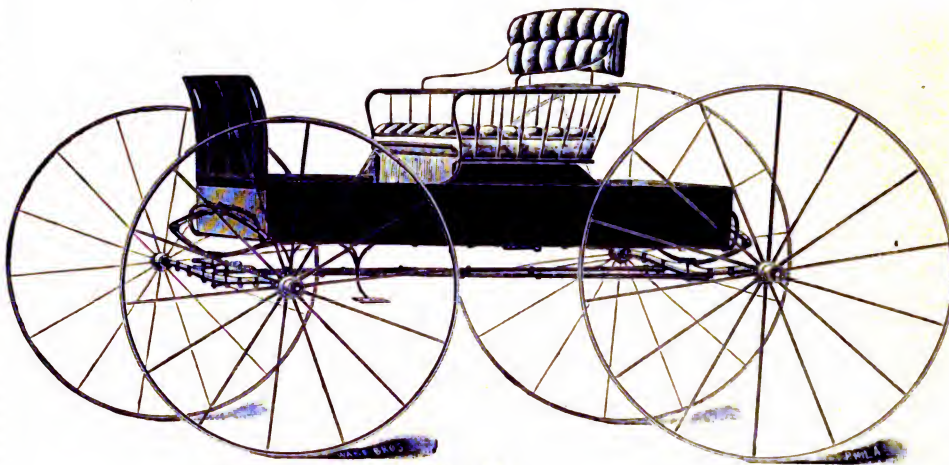
WRITE FOR CATALOGUE, TERMS, ETC.

G. W. & H. D. CRAWFORD CO.

DELHI, N. Y.

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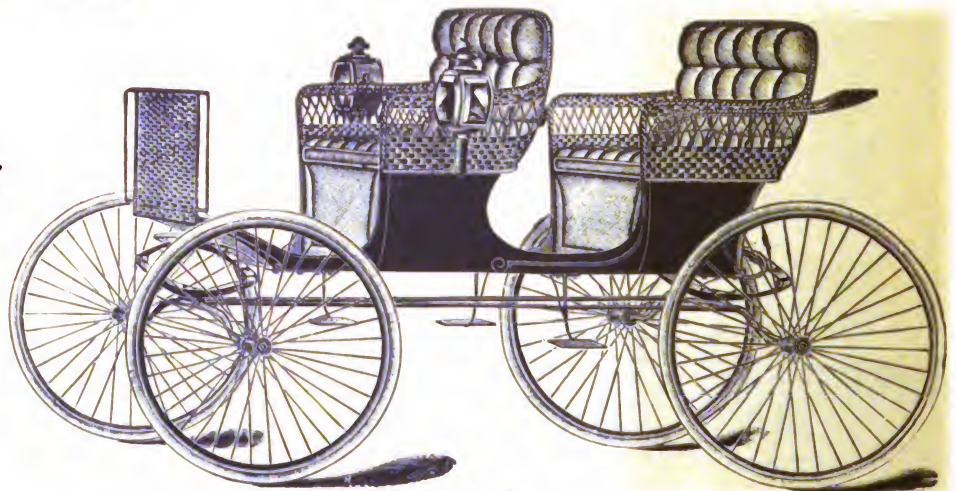
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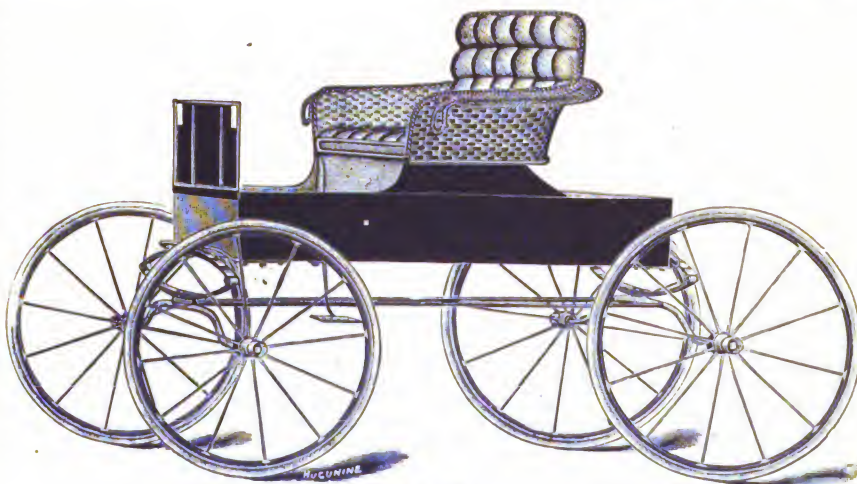
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for every job man-
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*Our Pneumatic
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Guaranteed.*



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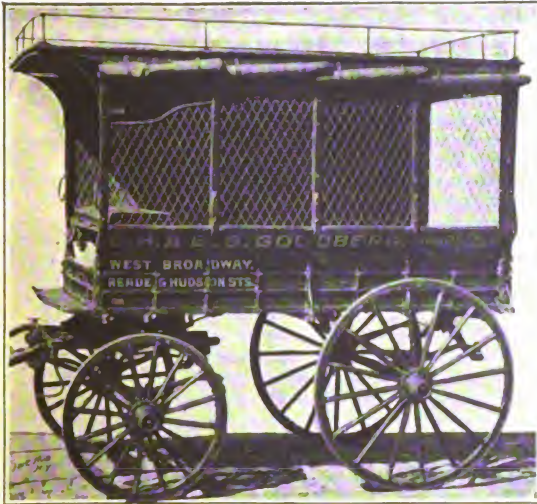
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Prices.*

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EASTERN SALES AGENTS.

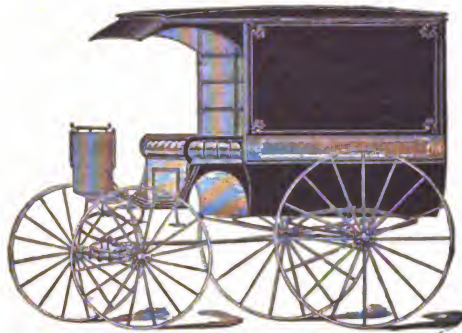
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T. H. H. MESSINGER,
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FINE CARRIAGES
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Best in the Market

We build
 Honest Wagons
 at
 Honest Prices.



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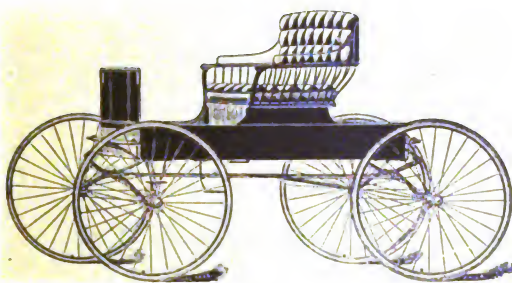
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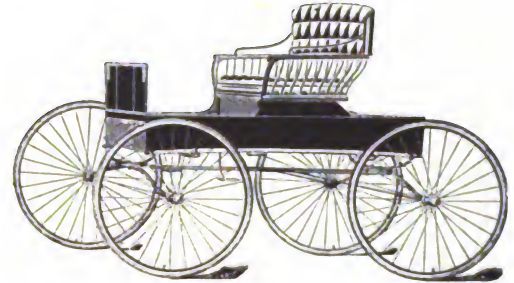


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MANSFIELD, OHIO.

COLUMBUS BUGGY CO.

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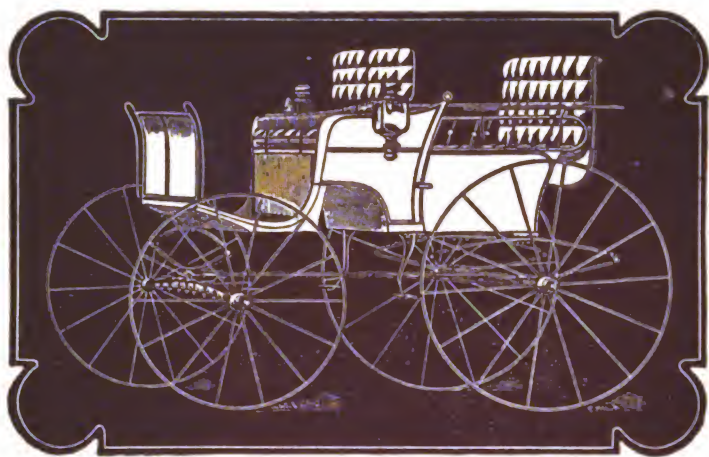
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DEALERS WHO ARE WIDE AWAKE TO THEIR OWN INTEREST SHOULD NOT BE WITHOUT COLUMBUS BUGGY CO.'S VEHICLES. NO REPOSITORY IS COMPLETE WITHOUT THEM. THEY ARE STANDARD THE WORLD OVER. THE NAME GUARANTEES THE QUALITY. WE HAVE MANY NEW AND ELEGANT DESIGNS FOR 1900. GOOD SELLERS.

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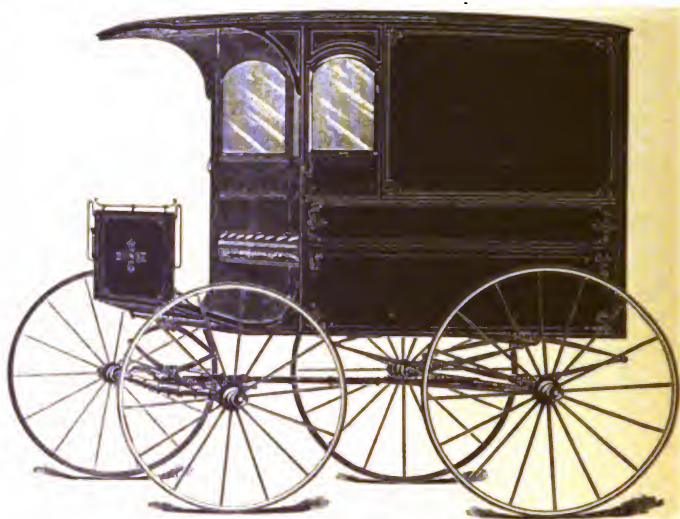
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*Good things usually come high, but then some articles
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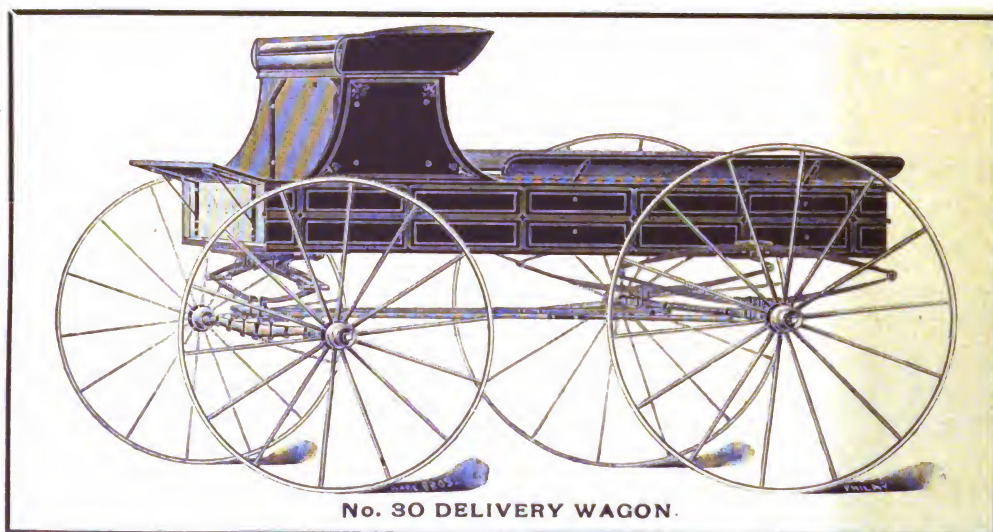
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AN IDEAL LINE OF Spring Wagons for the Dealer.

Carrying
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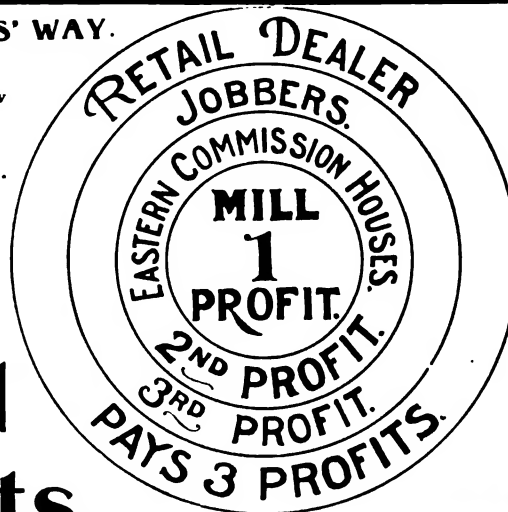
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They are not sold to Jobbers, Dry Goods, Catalogue or Department Houses..... Many Jobbers in the past year adopted the above style names, imitated the patterns and sold inferior grades, either as ours, or as good as ours.... It is a fraudulent practice... Retailers can buy the Genuine * * * * * Blankets from us only * * * * * From Mill Direct to Retailer.

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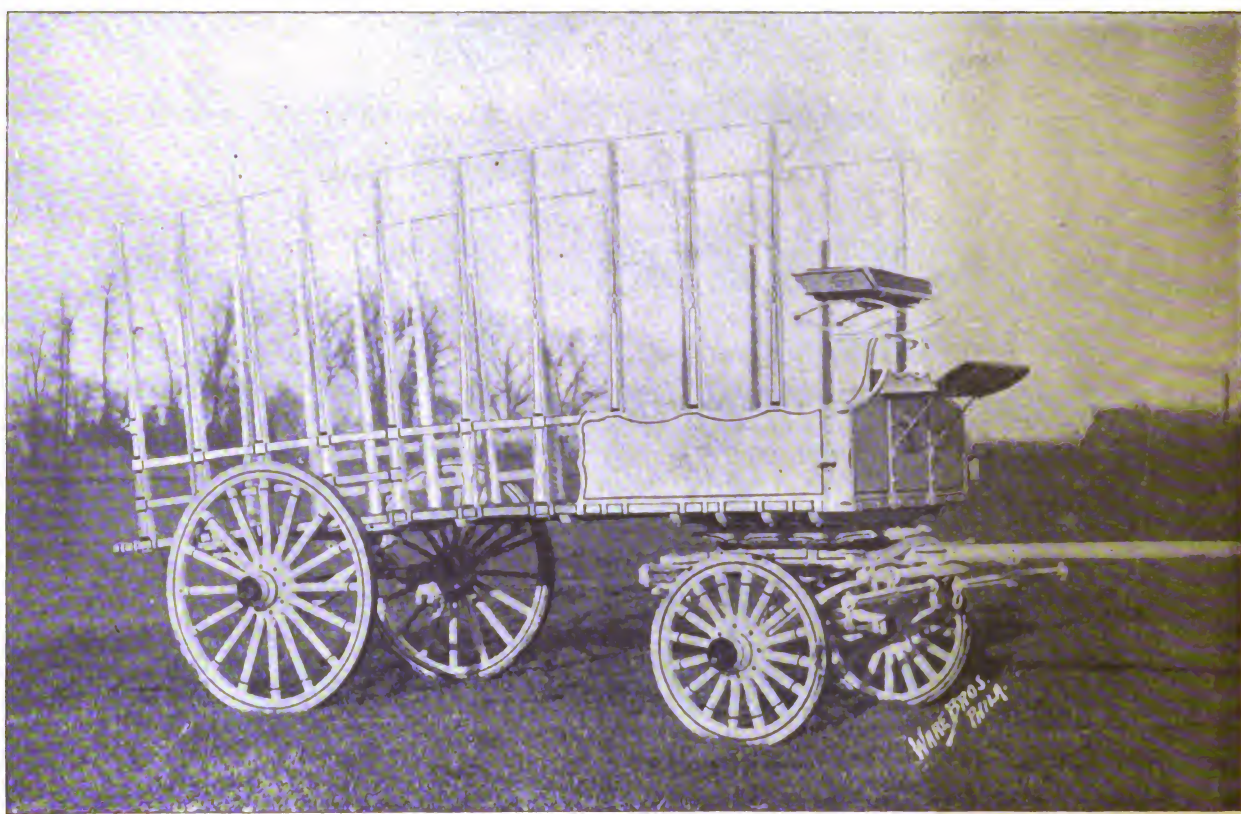
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is surrounded with Ash, Hickory, Iron,
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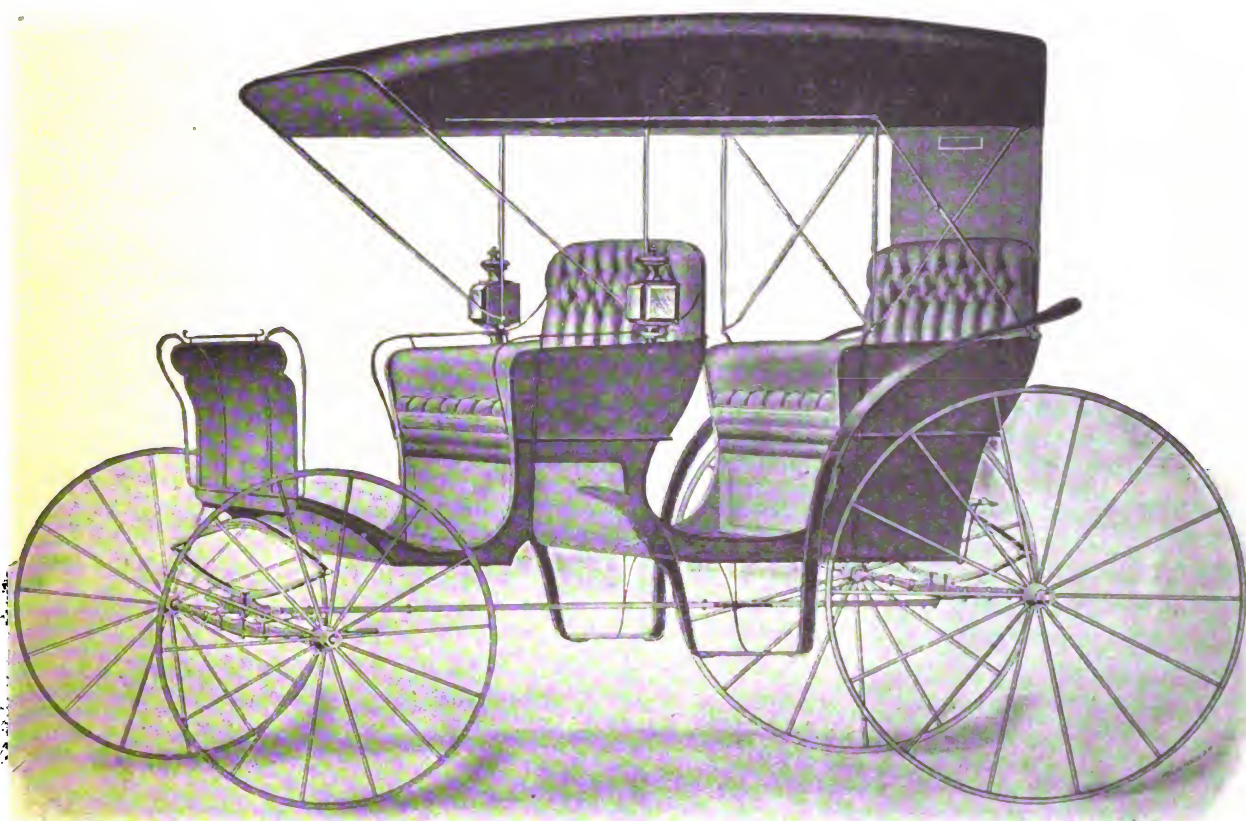
Builds United States Screen Mail Wagons,
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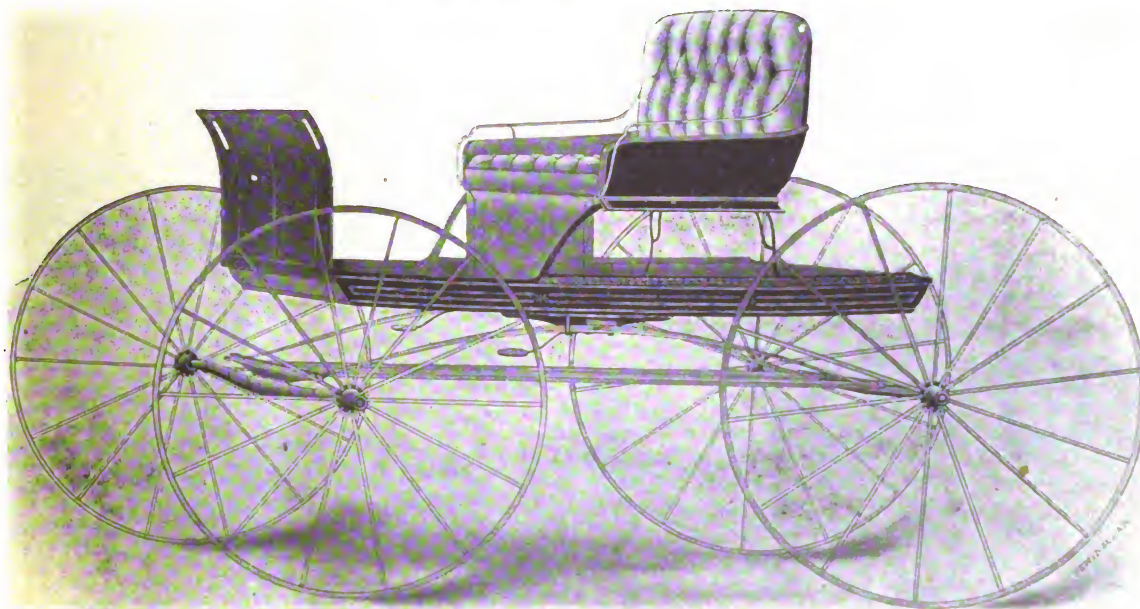
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Our elegant new art catalogue fully describes the many good qualities of the above two vehicles, and also many other styles that will interest every up-to-date dealer who is desirous of serving his trade with the latest and best vehicles the market affords. Be sure and send for our prices before buying. You will find them astonishingly low on such high-grade goods. ✱ ✱

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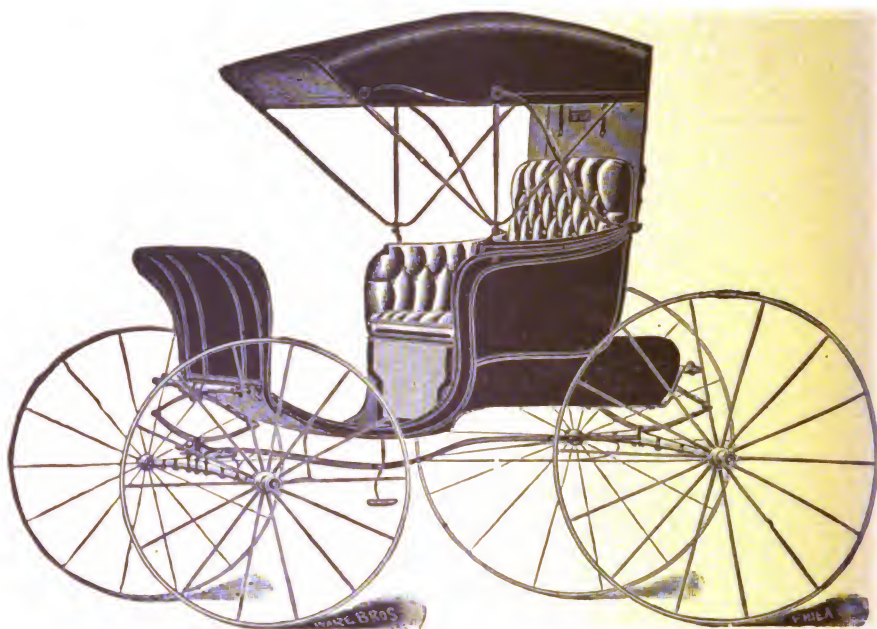
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PHAETON

"STANHOPE."

It is impossible to do this vehicle justice with an illustration, it being complete to the minutest detail, and is constructed with an eye single to the wants of the physician. We have equipped it with every convenience for his comfort and it is easy of ingress and exit. In all a very attractive and up-to-date carriage, and like all our specialties sells almost on sight.



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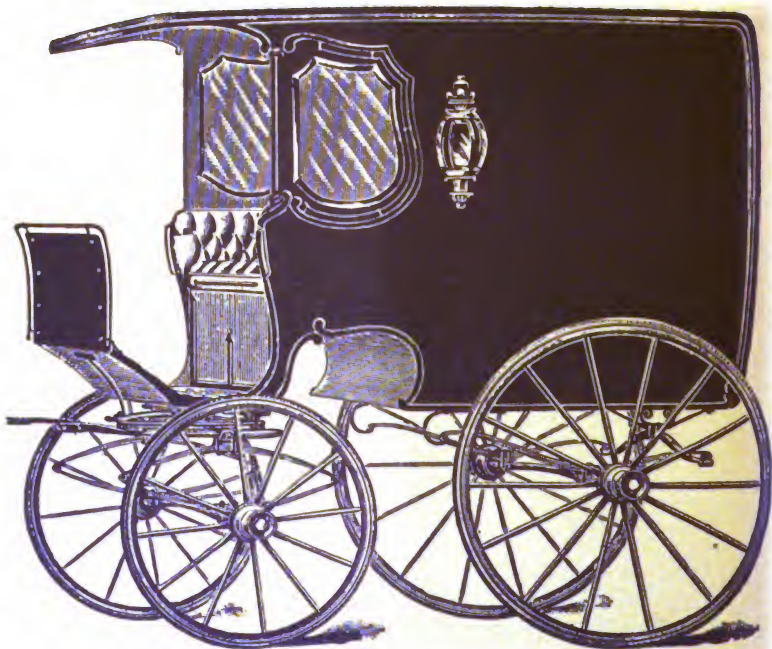
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Strictly
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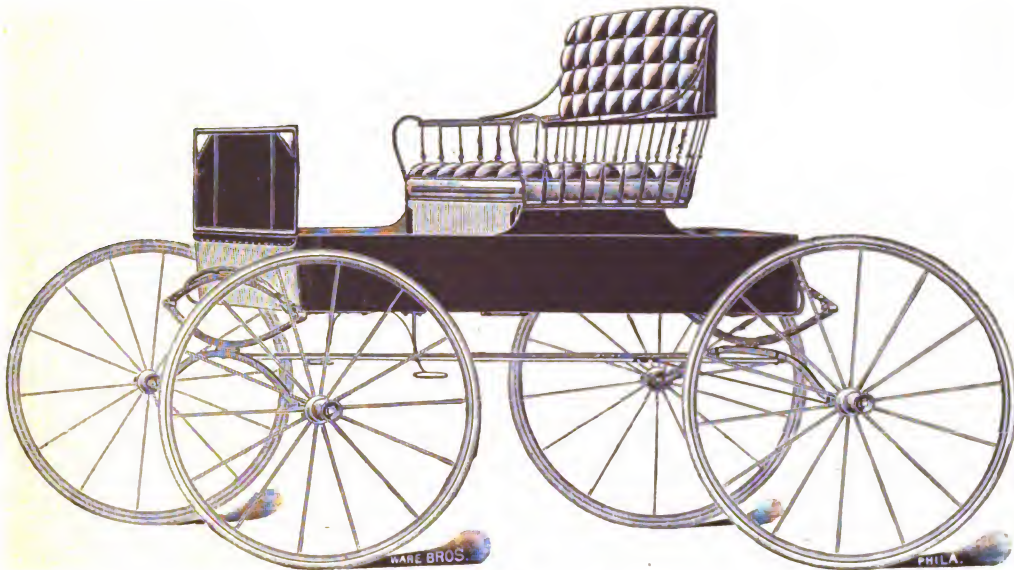
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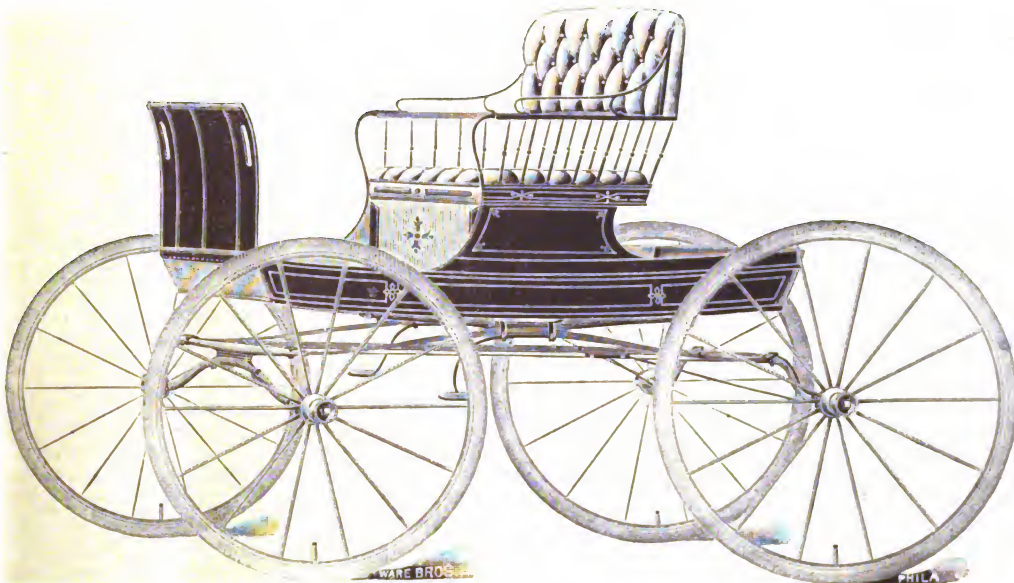
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It's a Beauty

AND WILL SELL ITSELF—LOW PRICE, STYLE, COMFORT AND FINISH—ALL THE NECESSARY ELEMENTS in a READY SELLER.



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No. 32. Lexington Concord. Pneumatic Tire.

No longer an experiment, but a pronounced success—is the verdict of the dealer regarding our Concords this year. ✱ ✱ ✱ ✱ ✱ ✱ ✱
Western Amesbury goods, made by PONTIAC BUGGY COMPANY, are surely in the-foreground to-day. Give us a call. ✱ ✱ ✱ ✱ ✱



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Our low down ball bearing, short turn
MILK and **BAKERY** Wagons are giving
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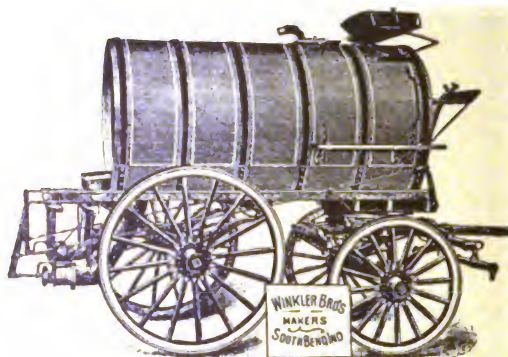
They have the finish, material and all the
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**BEST MADE.
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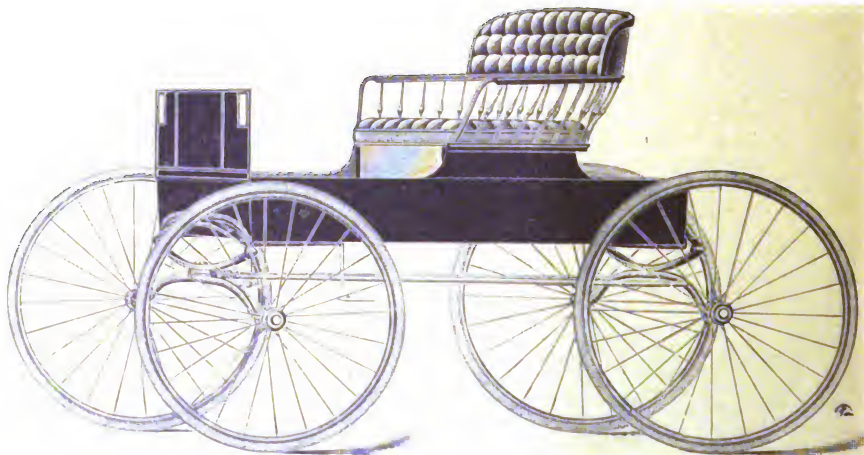
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NEED
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THE

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Our Prices Are Low
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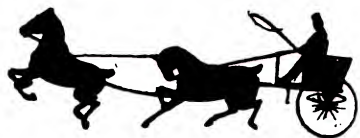
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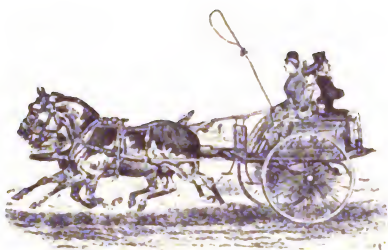
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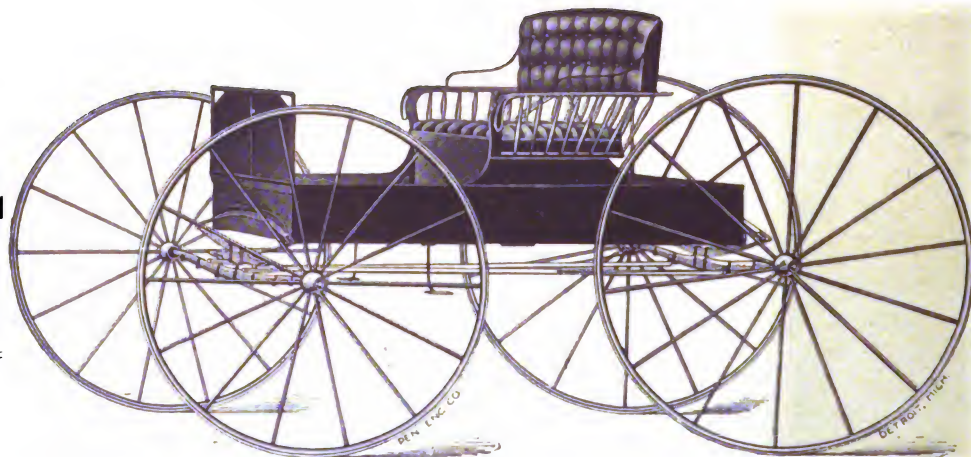
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every time.



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FAST SELLERS

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BODY . . . 23x58 inches, with convex panels. Fancy spindle seat, with solid back. Bailey hangers. Rubber pad steps and seat fenders.
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TRIMMINGS Whipcord, broadcloth or fancy leather. Extra quality velvet carpet, full length.

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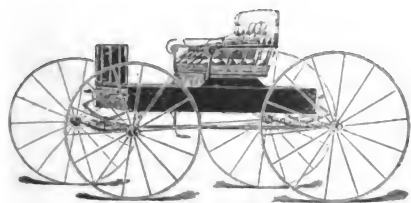
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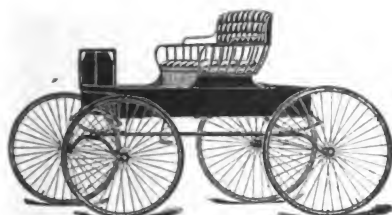
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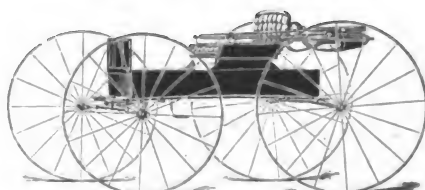
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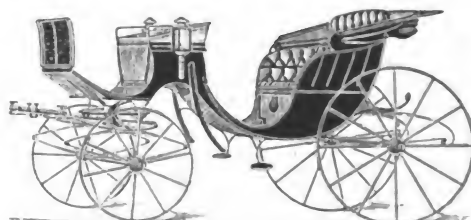
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No. 761.



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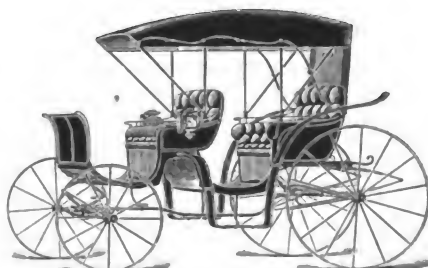
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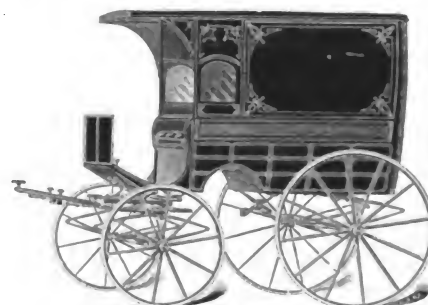
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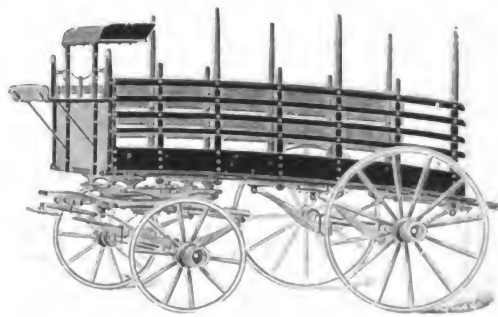
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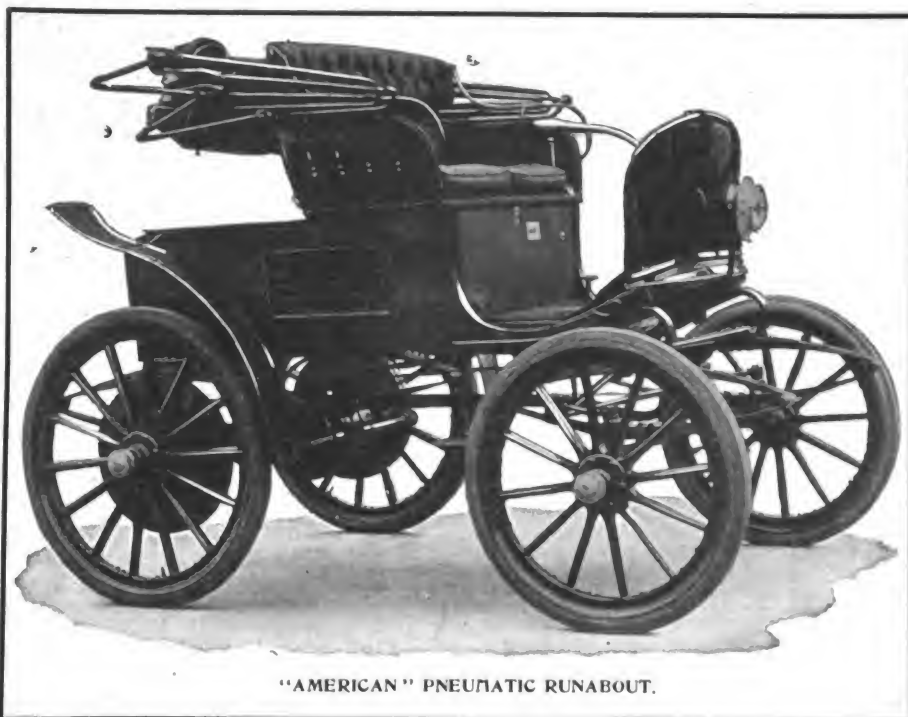


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“AMERICAN” PNEUMATIC RUNABOUT.

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Our Single Motor Equipment

with hollow armature shaft and solid rear axles, is *OUR OWN SPECIAL AND PATENTED DEVICE*. It secures us the most simple and durable form of motor construction and the most economical and efficient method of delivering power to the wheels. ✖ ✖ ✖ ✖ ✖ ✖ ✖ ✖

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Our Catalog


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GLINES' LIQUID RUBBER
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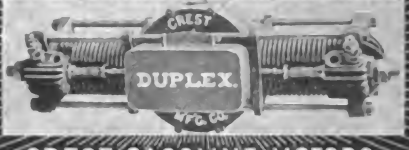
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RETAILS FOR 50 CENTS.

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CREST GASOLINE MOTORS
FOR
TRICYCLES AND AUTOMOBILES.

MILLIONS
OF OUR
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AND
NIPPLES
IN USE TO-DAY.




For...
Automobiles,
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Special Coils for Igniting Gas Engines
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Secondary coil gives fat jump spark.
Weight, three pounds; dimensions, 8 x 4 x 4 inches.

Write us regarding our **ELECTRIC SPECIALTIES.**

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Saves Oil,
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No Hot Box,
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Control,
Always Clean

Will run all kinds of Oil, not only in summer, but also in winter. It is the only article of its kind which successfully carries a thick Oil.

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Woods Motor Vehicles

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STYLE,
LIGHTEST
WEIGHT,
LOWEST
PRICED
ELECTRIC
VEHICLE IN
the WORLD.**



Weight, 1,000
pounds; Speed
per hour, 14
miles; mileage
capacity, one
charge, 25
miles.



**Price,
\$1,000
net.**

**Price
Without
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illustrations of
latest styles in
Automobiles.

ROAD WAGON WITH TOP.

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I am prepared to furnish detail designs of electric and hydrocarbon motors of minimum weight and maximum efficiency.

Designs of controllers, of few parts and extensive performance.

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Complete working drawings of all electrical and mechanical details necessary for constructing motor vehicles.

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I can also supply actual construction from the drawings, making the patterns, parts, or completed machines.

If you are entering or contemplating to enter the motor vehicle field send me your address.

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OAKMAN MOTOR VEHICLE CO.,

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Hydro-Carbon Motor.
Electric Current required for Ignition provided
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Ignition Regular and reliable.

Speed at Will of Operator and
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Motor Started from Seat by
Simple Device.

One Lever Controls every
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Cost of Operating
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Very Attractive.

Simple in Con-
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able.

Weight 475
Pounds.



**INSIST ON
SOLAR AUTOMOBILE LAMPS**
AS EQUIPMENT
ON ABOVE VEHICLE.

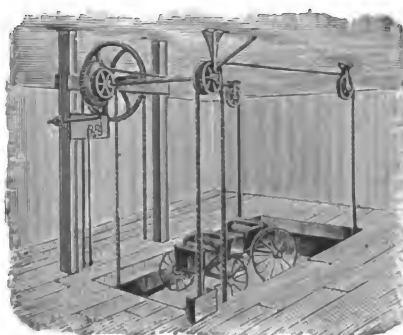
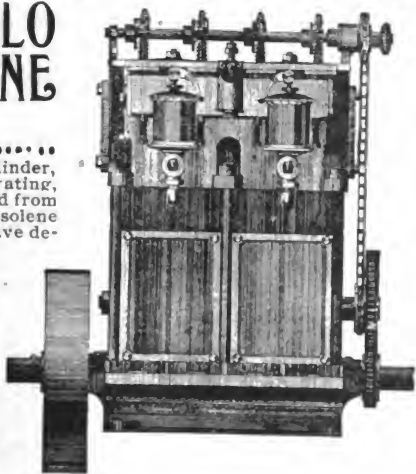
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THE BUFFALO GASOLINE MOTOR

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build from one to eight
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BUFFALO GASOLINE MOTOR CO.

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Elevators,

Passenger and Freight
of every description.
Send for Circulars.

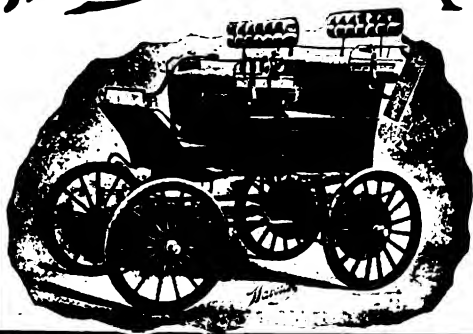
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SOLAR AUTOMOBILE LAMPS**
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OUR LINE COMPRISES 18 MODELS, FROM A TWO-PASSENGER RUNABOUT TO A NINE-PASSENGER BREAK, ALL GUARANTEED MECHANICALLY AND ELECTRICALLY. WE REMOVE ALL DOUBTS AS TO EFFICIENT DURABILITY BY SUPPLYING A CONTRACT TO MAINTAIN BATTERY FOR FIVE YEARS.

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To enlist capital for the development of inventions.

FURNISHES:—Specialists to make thorough examinations of patents.
Experts to test motors and automobiles.
Opportunities to inventors to present properly their propositions to concerns willing to consider and to undertake the same.

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AUTOMOBILE PATENTS EXPLOITATION COMPANY,
27 WILLIAM STREET,

F. B. HYDE, SECRETARY.

NEW YORK.



FACTORY OF THE MOBILE COMPANY OF AMERICA—VIEW LOOKING SOUTH.

perfecting methods and special tools for the manufacture of the automobile carriage invented by the Messrs. Stanley. The carriage thus perfected is to be known as the "WESTCHESTER COUNTY MODEL," to distinguish it from the carriages of the Stanley design turned out at the works in Massachusetts. It carries the very latest improvements and the orders for its construction have been to use only the finest quality of material, and to spare no pains to turn out the best of which the most skillful workmanship is capable. It is believed that the "WESTCHESTER COUNTY MODEL," built at the factory of THE MOBILE COMPANY OF AMERICA, is not excelled in strength, durability and excellence of design.

WHAT THE MOBILE IS.

The "WESTCHESTER COUNTY MODEL," built by THE MOBILE COMPANY OF AMERICA, is a horseless carriage weighing less than five hundred pounds, and costing but six hundred and fifty dollars. Compactly built, with workmanship of the finest quality, capable of traveling twenty miles or more an hour, or reducing its speed so that it can take its place in the slowly moving and stopping line of travel in the great cities, it is operated by steam under circumstances which render it absolutely safe. More than a thousand Stanley carriages of the Massachusetts model are now in public use, and there has never been a single boiler accident. The fuel shuts off automatically when the steam reaches one hundred and sixty pounds. There is a safety-valve which opens at one hundred and seventy pounds. Each boiler is wound with piano-wire and tested up to six hundred pounds pressure, and is calculated to withstand a strain up to thirty-five hundred pounds pressure to the square inch. Recently, as an experiment, a boiler was placed in an excavation, all valves closed, and the fire turned on full head. A gauge carried off to a distance showed a steam pressure of twelve hundred pounds. Then the steam began to drop, owing to a slight escape around the head of each of the copper tubes which compose the boiler flues, and the pressure did not rise above the twelve hundred pounds indicated, until all the water was exhausted. If the water supply should be exhausted in the boiler through oversight, the pressure drops and the boiler ceases to produce steam, and with the decreased pressure of the steam the carriage comes to a stop and the pump which supplies water ceases to work.

REGARDING THE PRICE OF \$650.

The factory of the company has been fitted up with the most perfect machinery and special tools, all new and of the latest design, for manufacturing on the most extensive scale. In this way the company proposes to bring the price within the reach of every class. The charge made is SIX HUNDRED AND FIFTY DOLLARS, payable upon delivery at the Kingsland Point station of the New York Central Railway. The claim made for THE MOBILE COMPANY'S "WESTCHESTER COUNTY MODEL" is that it has no superior in the world's markets to-day.

THE MOBILE'S RADIUS OF MOTION.

One of the improvements in the "WESTCHESTER COUNTY MODEL" is a tank made from seamless copper tubing, giving a fuel storage capacity double that in the original Stanley carriage, and equal to one hundred miles' run on smooth, level roads. The MOBILE can travel over any class of road, rough or smooth; but it must be distinctly understood that the rougher the road the more fuel required.

THE MOBILE BUILT TO CLIMB THE STEEPEST HILL ROADS.

The question of steep grades is an annoying one for the average horseless carriage. Not so for the MOBILE. It can climb on a fairly made road up a fourteen per cent. grade (which is considered a pretty steep country road) at the rate of fifteen miles an hour. During last summer Mr. Freeland O. Stanley and his wife ascended the long, steep road up Mount Washington in two hours and twenty minutes.

IN THE MATTER OF COMFORT.

The MOBILE is perfectly smooth in operation. It moves without jar or vibration of any kind. When in motion, the products of combustion are carried underneath the carriage, and neither heat nor odor of any kind arises. The machinery is noiseless, except in climbing stiff grades, when a slight puffing is audible, but nothing in the least degree objectionable.

There are more than a dozen improvements in the present carriage over the Stanley carriage as originally put out. The first and most important of these is in the engine. The second relates to the gasoline tank, which now holds double the quantity of oil formerly carried. A seamless copper tube, very strong in construction and elliptical in shape, secures this much to be desired result.

Another marked improvement is in the ball bearings of the engine, which are one-half inch instead of three-eighths inch as formerly, experience showing that the increase of strength thus obtained is an item of great importance.

The other improvements are largely in details of construction, no effort in time or money having been spared to work out the most perfect results.

The question is frequently asked, "What guarantee is given to the intending purchaser?" To this we reply that we guarantee our materials and workmanship to be the best that money can produce. Our factory, however, is open to the inspection of intending purchasers, and it only needs a visit to the various departments to satisfy an expert as to the excellence of the work being turned out.

The claims which the MOBILE makes upon the public confidence may be briefly summed up as follows:—

First. The lightest, most compact, best designed and most perfect horseless carriage now before the public.

Second. The highest class of materials and workmanship.

Third. Cost—but \$650.

Fourth. Simplicity in construction, odorless when running, and almost noiseless.

Fifth. It can speed at a gait up to thirty miles per hour or follow the slowest truck.

Sixth. It is operated by steam, the standard power of the world, under perfect regulation and test.

Seventh. Its fuel is inexpensive; it carries a supply for fifty to one hundred miles, according to the character of the road, which can be procured at any drug-store at slight expense.

Eighth. It embraces all the latest improvements, and is confidently recommended as the most perfect piece of machinery now on the market.

The probabilities are that not one automobile carriage will be built during the coming season where ten will be required to supply the demand. The impression prevails that there are a great number of horseless carriage factories being erected and that the output will be large during the coming season. The fact remains that there are not in operation in the United States at this time factories capable of turning out twenty machines a day other than the Stanley carriage. After three years of experiment on the part of the Messrs. Stanley, and nine months spent on the construction of a factory, we are only now in a position to turn out carriages on a considerable scale.

A carefully prepared book of instructions will be furnished with each carriage sold, and it is possible for any one with some mechanical knowledge to master the handling of the MOBILE from the instructions therein given. Unmechanical purchasers living at a distance who cannot come to the factory for instructions are advised to secure a careful and competent engineer, a man of good judgment and likely to be thorough, who can master the machine and then instruct the purchaser.

INSPECTION OF VEHICLES.

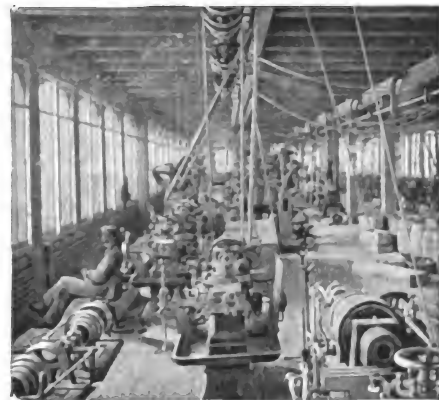
The MOBILE carriage, "WESTCHESTER COUNTY MODEL," may be found from 9 A. M. to 6 P. M. in front of the New York Offices of the company, Fifth Avenue and Forty second Street, and the Times Building.

Intending purchasers are invited to visit the factory at Kingsland Point, Tarrytown-on-the-Hudson, where instruction will be given in handling the carriage.

KINGSLAND POINT WELL ADAPTED FOR TRYING AUTOMOBILES.

The Philipse Manor property contains many beautiful roadways, steep, level, good, and some bad, so that the purchaser or intending purchaser will find it admirably adapted as a place to try automobiles.

Tarrytown is a little more than half an hour's run from New York by the fast trains. Of the fifty-nine accommodation trains which stop at Tarrytown station, fourteen each day stop at Kingsland Point upon application to the conductor. Kingsland Point itself is considered to be one of the two or three most beautiful places on the Hudson. It stands well out on the Tappan Zee, with Grant's Tomb visible on a clear day to the south, and a great stretch of water to the north off into the Highlands. The place is full of historic memories. The original Philipse Manor and mill, more than two hundred years old, are still standing. The "Headless Horseman's Bridge" is near by. The mansion was the center originally of the Philipse estate, which embraced two hundred square miles, and reached from Spuyten Duyvel to Peekskill. It seems proper that here should be opened the manufacture of automobiles, for here were begun more than two hundred years ago manufacturing operations on the Hudson.



NORTH END MOBILE COMPANY'S FACTORY.



THE HEADLESS HORSEMAN'S BRIDGE AS IT WAS FORMERLY.

man's Bridge" is near by. The mansion was the center originally of the Philipse estate, which embraced two hundred square miles, and reached from Spuyten Duyvel to Peekskill. It seems proper that here should be opened the manufacture of automobiles, for here were begun more than two hundred years ago manufacturing operations on the Hudson.

THE "MOBILE" COMPANY OF AMERICA

JOHN BRISSEN WALKER, President.

WILLIAM A. BELL, Vice-President.

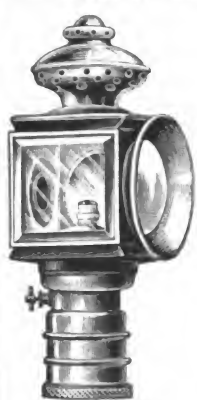
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BUNDY ACETYLENE GAS LAMPS. ONE GRADE—HIGHEST.

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THEY LOOK WELL.

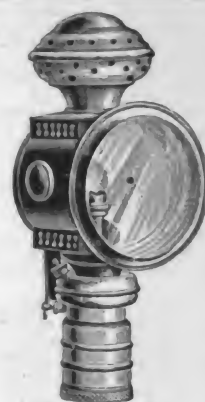
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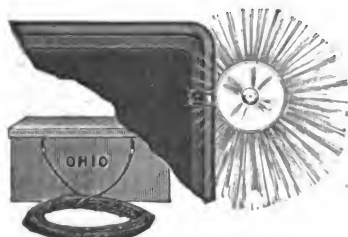


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THE STYLISH-OHIO Electric Carriage Light

OPERATED BY SERIES-MULTIPLE DRY BATTERY

Solves the Problem of Portable Lighting, and gives to us
a Driving Lamp that is at once



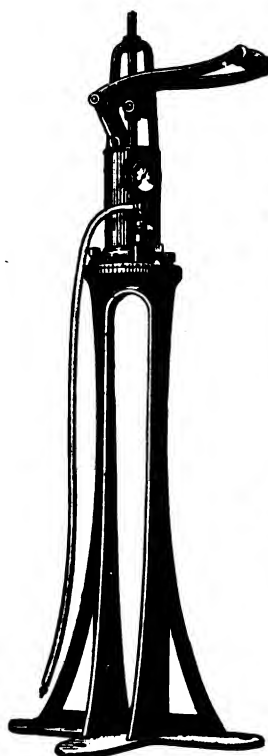
**Efficient,
Elegant and
Economical.**

Eight or ten of our improved dry cells are arranged in a neat case, in series-multiple, so as to obtain long life, and no charging or other attention is required. The outfits are furnished ready for use and can be attached to any carriage in one minute. The light can be turned on and off at will. The Reflector, a true parabola, magnifies eight times the three-candle lamp, causing it to throw its rays two hundred feet. The Lamp is six times the efficiency of ordinary incandescent lamps, taking only one-half watt to the candle-power. At an e. m. f. of 7 volts only .20 of an ampere is used, a fine light produced, and imperceptible use of the battery readily recuperated by a day's rest.

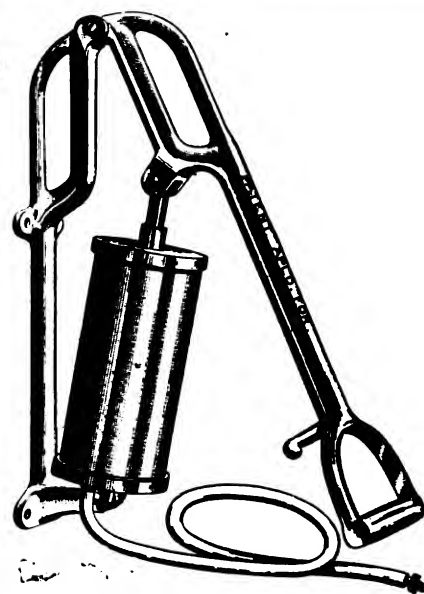
\$3.95 This outfit consists of Lamp, Reflector, Combination Bracket for attaching to carriage, Conductor Cord, Connectors and 8-cell Dry Battery in neat case, ready for use. Our lowest price for this outfit is \$3.95; two for \$7. *Catalogue free.*

Ohio Electric Works, CLEVELAND, OHIO.

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No. 121.




No. 56.

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Automobile Tires.**

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**HOUSTON AND MERCER STS.,
NEW YORK, U. S. A.**



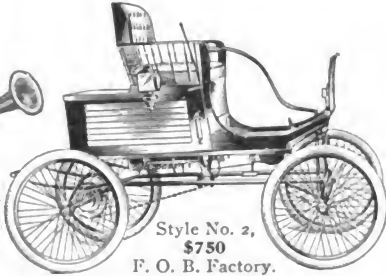
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SPEED
ECONOMY

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STATE OF ILLINOIS: Illinois Electric Vehicle Transportation Co., 173 Michigan Ave., Chicago, Ill.
NEW ENGLAND STATES: New England Electric Vehicle Transportation Co., 15 Congress Street, Boston, Mass.
DISTRICT OF COLUMBIA: Washington Electric Vehicle Transportation Co., Panorama Building, 15th Street and Ohio Avenue, Washington, D. C.
STATE OF NEW JERSEY: New Jersey Electric Vehicle Transportation Co., 1-0 Broadway, New York City.
STATE OF CALIFORNIA: E. A. BROOKE RIDLEY, Agent, Parrott Bldg., Market Street, San Francisco, Cal.
MANAGER FOR EUROPE: HART O. BERG, 54 Avenue Montaigne, Paris, France.



In territory not represented by local companies
all communications should be addressed to

Electric Vehicle Co.,

100 BROADWAY, NEW YORK, U. S. A.



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New Process Raw Hide Pinions are used by all the leading manufacturers. Spur, Bevel and Friction. We also furnish Metal Gears.



AUTOMOBILE CIRCULAR FOR THE ASKING.

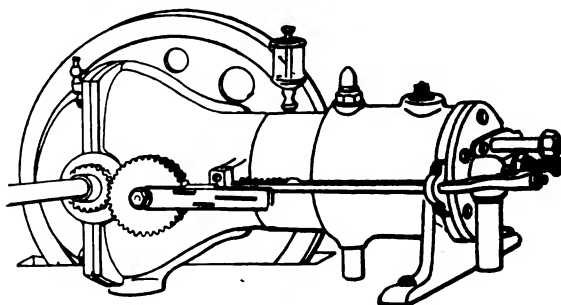
The New Process Raw Hide Co.

Patentees and Sole Manufacturers,
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THE ONLY RELIABLE MOTORS FOR HORSELESS VEHICLES.

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WE believe this to be the very best Gasoline Motor ever placed on the market for simplicity, durability, more power and less weight than anything ever produced. Especially adapted for Motor Wagons, Boats, Small Electrical Plants, Elevators, Machine Shops, Optical Works, Printing Presses, Feed Cutters, Carpenter Shops, Lathes, Emery Wheels, Corn Shellers, Laundry Machines, Pumping Water, Ice Cream Freezers, Irrigation Machinery, Ventilating Fans, Hay Presses, Cream Separator, Sewing Machines, Mining Machinery, Sawing Wood, etc., etc. These Motors are manufactured horizontal or upright. They are absolutely safe, and cannot explode or cause damage, and are always ready for instant service. They require no mechanical experience or licensed engineer.

Our 2-horse-power Motor weighs but 80 pounds, and occupies a space 24x11 inches; runs at high speed and high compression.

Working parts are all tightly enclosed; one sight feed oil cup lubricates all bearings. Our ignition device is perfect, and all wearing parts are especially strong and substantial.

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THE ST. LOUIS GASOLINE MOTOR CO.

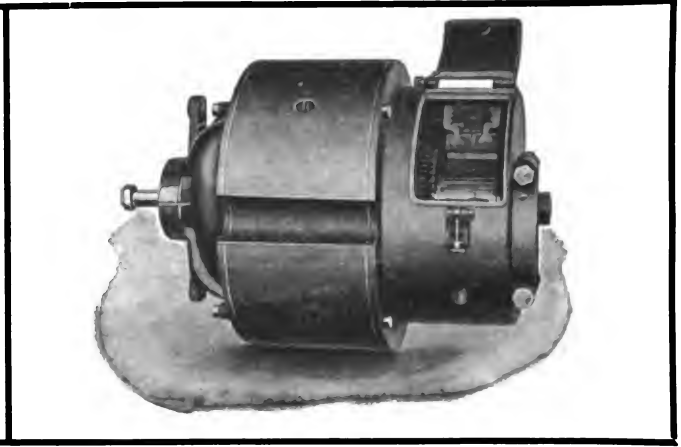
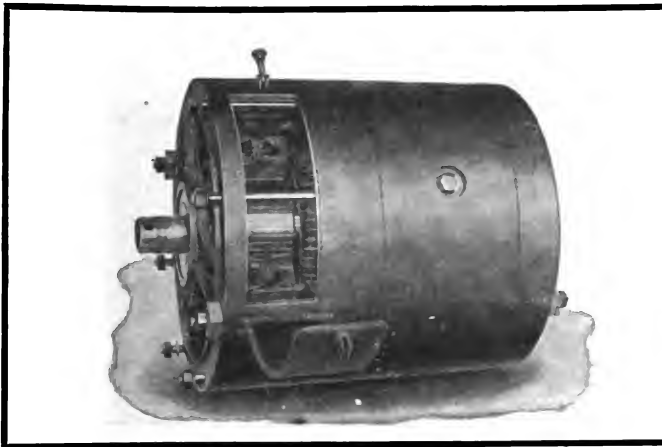
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15 YEARS' PRACTICAL ELECTRICAL EXPERIENCE.



Motors designed to suit the individual requirements of manufacturers. Our Automobile Motors are running to-day on hundreds of motor vehicles and are giving universal satisfaction.

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CHICAGO OFFICE, Marquette Building.

"Locobile" A Special Oil For Special Use.

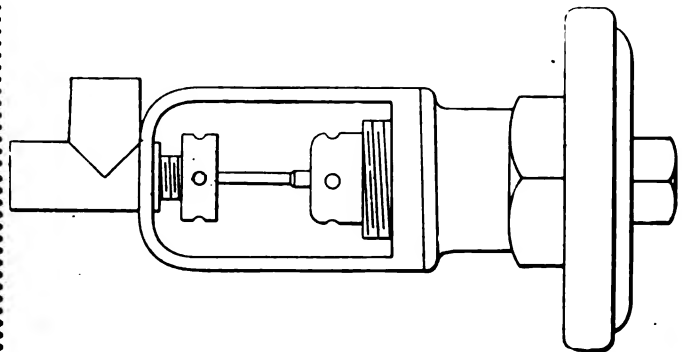


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Locomobile and Steam Vehicle Fittings.



GASOLINE Regulators and Burners, Water Level in Boiler Regulators, Pin Valves, Check Valves, Safety Automatic Shut-off Valves, Gauges, Injectors, and a full line of everything in fittings used in constructing a steam carriage, including Boilers, Engines, Mufflers, etc.

We contract to furnish manufacturers with the above in quantities to suit, at low figures.

Address all Communications
Automobile Department,

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ESTABLISHED 1816

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The Hub

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No. 2.

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W. H. TAYLOR, President.

WALTER D. GREGORY, Treasurer.

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THE HUB is devoted to the interests of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also to the interests of Dealers.

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ENGLAND.—R. Applegarth, 11 Queen Victoria st., London, England. Subscription price, 12s. 6d., or \$3.00.

FRANCE.—L. Dupont, publisher of *Le Guide du Carrossier*, 135 Boulevard Haussmann, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bonn a. Rh.; H. & T. Hampe & Co., 64 Alteswall, Hamburg. Subscription price, 12 marks, postpaid.

AUSTRALIA.—Henry Box & Son, 442 Little Collins st., Melbourne, Victoria. Subscription price, \$3.00 in advance.

The Automobile and the Horse.

THE changed attitude of leading daily journals regarding the future possibilities of the automobile and horse is one of the favorable signs of the times. It will tend to popularize the automobile in the minds of thinking men, strengthen legitimate manufacturers and eliminate the adventurers, who, for stock-jobbing purposes, flood the country with tales of fiction that should make an honest man blush. This elimination will strengthen the hands of the men who have invested capital, established modern plants and are building automobiles that possess the necessary requirements for success, for pleasure, sporting and business purposes. THE HUB has contended from the beginning that to make the motor vehicle a success it must be built and finished on carriage lines, and the business must be conducted in a legitimate manner, and it is with pleasure that we review the field and find vehicles of artistic merit as well as mechanical excellence, and factories where business is conducted on the highest standard of busi-

ness honor. We have never insisted that the motor carriage be a simple copy of the horse drawn vehicle, but we have claimed that the closer the general characteristics can be followed without impairing the motive power, the better, recognizing at the same time that as the art of motor vehicle building becomes better known styles would be modified, and the beauty of the motor carriage, as well as its adaptability, would be increased, and all this without injury to the vehicle industry of to-day; on the contrary, to its betterment. We are looking ahead to the time, and hope it will be short, when the builders of the mechanical and animal power vehicles will affiliate and the interests of each will be the interest of both, and that the prosperity of both will be in keeping with the advanced civilization, the artistic culture, and the educational elevation of the twentieth century. Pleasure riding was never more popular than it is to-day. Speedways, new drives, improved roads, everywhere attest the growing desire to obtain those pleasures and exercises that come from riding and driving. There are those who agree with the London physician, who found "the outside of a horse the best thing for the inside of a man." Others will select the motor, health and pleasure will be increased, and all will say with the *New York Herald*, that it is not the passing of the horse, but the passing of "shanks' mare."



The Repository and Salesman.

DID you ever enter a carriage salesroom and feel a chill come over you as you crossed the door sill? No doubt you have, and the first thought was, Why? But the mental question was no sooner asked than answered. You looked around and saw a room that was uninviting; an air of carelessness was everywhere apparent. The carriages were arranged with little or no regard as to light or convenience. You walked half across the floor before a salesman appeared, and when he spoke there was another chill, and you wished yourself out on the street. In a perfunctory and supercilious way you were shown around the room, and your questions were answered in a manner that led you to believe that the man was born tired. You found a well-assorted stock and could have selected a satisfactory vehicle, and would have done so had it been shown under more agreeable conditions and surroundings. You went away, however, without buying, and wondering why a man who showed such good judgment in selecting his stock should evince so little taste and care in arranging it and in fitting up his repository, and more than all, why should he not employ a salesman who could be agreeable to all customers? You went elsewhere, and instead of a chill on entering there was a sensation of pleasure. The room was inviting; a soft, mellow north light gave clear

shades and colors, all the vehicles being arranged so as to obtain the best lights possible. The salesman was quick to meet you, and greeted you pleasantly and in a gentlemanly manner; he showed you through the stock and awaited your pleasure as to the specific kind of a vehicle you were looking for. When you announced the kind you were looking for he immediately placed these where you could examine them carefully, as the repository was not so crowded as to prevent this. He proved his capability by answering all your questions promptly, and by pointing out special features. His whole manner carried an evidence of truthfulness. He quoted prices promptly, and when protests were made he gave his reasons for his specific charges. There was no dickering, no jockeying; he had goods for sale and at fixed prices, and he meant that you should have full value for your money, and that all customers were treated alike. You made your purchase and went away satisfied, and after leaving you asked yourself why the difference between the two places and men, and then you took the matter home to yourself and asked, "Which do I resemble?" and resolved that come what would, you would emulate the man and place that gave you the greatest satisfaction.



Papers on Foreign Trade.

THE attention of our readers is called to a series of papers being published in THE HUB on foreign markets for American products. The first of these appeared in the April HUB, under the caption, "An Opening for American Carriage Builders in Indo-China." In this number the paper relates to trade in Jamaica. These papers are prepared by a gentleman having exceptional advantages in collecting information, and who treats the subject in a clear and concise manner, and by publishing them THE HUB contributes a valuable work in the direction of building up American commerce and in the opening of markets for American manufactured products.



Trusts.

JUST now the politician is holding up his hands in holy horror of trusts, and is predicting disasters without number to the "workingman." These would-be country savers think much of the "workingman" just now because of the vote which he will cast on election day. THE HUB is anti-trust in its opinions, but it recognizes that there are combinations that work to the advantage of all. Just where to draw the line between unjust and just combinations, trusts and anti-trusts, we are as much at a loss as are those who have been trying to mark the dividing line for years past. We find combinations among workmen as well as among capitalists; some of these have proved beneficial, others oppressive. Any organization that prevents a man selling his labor for what he considers a fair equivalent or to whom he may, is as oppressive to labor as is a combination of capitalists or manufacturers who fix unalterable prices on their products. The fact that Andrew Carnegie received mammoth returns from his business does not say that he is not entitled to them; neither is it an argument against trusts, his plant has not been until recently a part of any trust or combination; and, further, it is acknowledged to be one of the most liberal in this country with its workmen. The right to associate together is conceded to all classes of workmen,

and it is a fact that of all the trusts in the land none are more exacting, or more powerful, than the labor trusts. As a whole, however, they have been beneficial, although at times they are arbitrary and cause much suffering among their members. It will be well, therefore, for workers who are members of labor associations to turn a deaf ear to the man on the stump, who would array them against capital trusts in order that these mouthy orators can live at the public crib. The country is prosperous, trusts or no trusts, and all attempts on the part of the politician to feather his own nest at the expense of labor should be frowned down without fear or favor.



One Too Many.

UNDER this caption *The American Exporter* calls attention to the *Monthly Bulletin*, published by the Bureau of American Republics, a publication run by the United States government in direct competition with the trade journals of our country. We publish the article in full, as it explains the exact situation in a clear and concise manner. This *Monthly Bulletin* has proved a losing venture from the start, and is of no earthly value to the industries of the United States. If those of our law makers who are so much exercised regarding publishers' mail rates would interest themselves in this *Monthly Bulletin* humbug, which government money pays for, and which has the free use of the mails as well, they would find ample opportunity to save money without disturbing the legitimate trade publications of the country.



Carriage Salesmen.

THERE are two distinct classes of carriage salesmen, those who sell to the dealer and those who sell to the consumer. Either may be a success in the one class and an absolute failure in the other. He who sells to the dealer has, if the dealer himself is a success, a keen, shrewd business man to deal with, one who knows just what his trade calls for, and the best price obtainable for his goods. He realizes that in his future transactions he must deal with a variety of tastes, and that his future success depends upon his success as a buyer. The manufacturer's salesman must be able to assist him wherever possible, and be competent to show up the advantages of the work he has to offer, and discriminating enough to avoid pressing undesirable goods. A pushing, energetic, able salesman in that line is the manufacturer's right hand man, and his merit is recognized, but the mistake is sometimes made in placing such a man on the floor of a retail repository, where individual buyers have to be dealt with, and where an entirely different line of reasoning is necessary. The customer may possess no technical knowledge whatever, but may be keenly artistic, or he may be a mechanical crank and know nothing of art, and might as well be color blind as not. Another may combine technical mechanical skill with true artistic sense of color and form, while a fourth may care for nothing but comfort. A fifth, the worst of all, may seek to impress the salesman with the idea that there is nothing that is not known by him in the art of carriage building. To handle all these different natures and sell to each and all, and send all away feeling thoroughly satisfied, and without anything to be called up that in the future would breed dissatisfaction requires the

skill of a diplomat, the presence of a polished gentleman, the fluent, outspoken frankness of a truthful man, and the strict honesty that prevents deception, implied or real. The lack of any one of these traits impairs the usefulness of a retail salesman, while the absence of them leads to failure. We say therefore to the successful salesman in the one line, whichever it may be, to keep on that line, and don't spoil a good salesman by making a change.

FRENCH STYLES.

WE illustrate herewith three French styles of carriages which contain suggestions of value to the American builder, and now that builders and buyers are alike seeking for new points, anything of

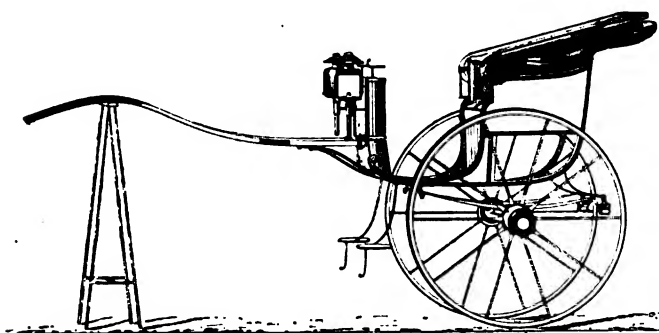


FIG. 1. PARK CART.
(From *Le Guide du Carrossier*.)

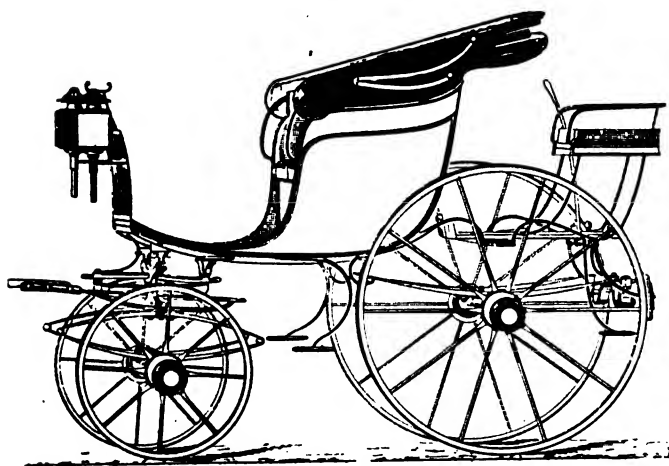


FIG. 2. DUKE.
(From *Le Guide du Carrossier*.)

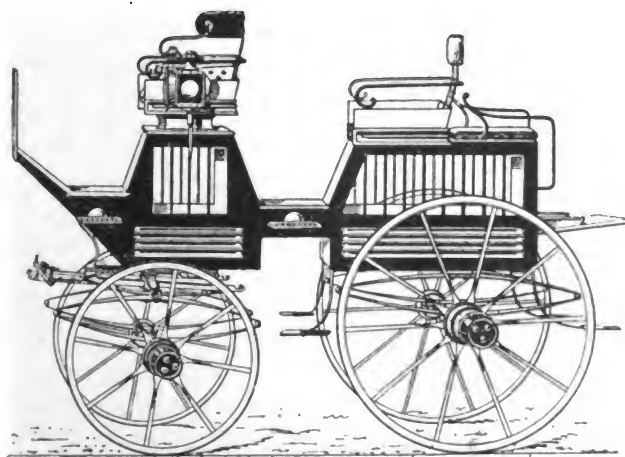


FIG. 3. BREAK.
(From *La Carrosserie Française*.)

merit becomes of value. Each of the illustrations embodies points that may be utilized. The most novel, however, is the break, to which special attention is called.

Description of Latest Styles.

GENTLEMAN'S DRIVING CART.

Scale, $\frac{1}{2}$ inch to the foot.

(See Fashion Plate No. 463.)

THE gentleman's driving cart illustrated by Fashion Plate No. 463 shows another of the styles of finish given to the carts now so popular for harness horses on drives and at horse shows. The peculiar feature of this cart is the manner in which the seat panel and the pillar panel are run together, making a continuous panel of the whole. It is one of the newest ideas, and when painted with strong contrasting colors presents an attractive appearance.

Dimensions of Woodwork.—Body, width across top, outside, 39 in.; across bottom, 32 in. Turnunder, $3\frac{1}{2}$ in. Wheels, wood hub. Height, 49 in. Hubs, length, 7 in.; diameter at center, $5\frac{3}{4}$ in.; front end, 4 in.; back end, $4\frac{1}{4}$ in. Size of spokes, 19-16 in. Number of spokes, 14. Stagger, $\frac{1}{2}$ in. Depth of rims, $1\frac{3}{4}$ in. Tread of rims, $1\frac{1}{2}$ in. Depth of bands, front, 3 in.; back, 1 in.

Dimensions of Ironwork.—Springs, side, 38 in. long between centers of heads, with $2\frac{1}{2}$ in. opening on main leaf. Width of steel, $1\frac{5}{8}$ in. Number of plates, 4. Thickness, Nos. 3, 4, 4, 5 steel. Cross, 38 in. long, with 3 in. set. Width of steel, $1\frac{5}{8}$ in. Number of plates, 4. Thickness, Nos. 3, 4, 4, 5 steel. Axles, $1\frac{1}{2}$ in. Tires, $1\frac{1}{2}$ in. by 7-16 in. Track, outside, 4 ft. 8 in.

Painting.—Body: The combination seat and pillar panels are painted sulphur yellow. The moldings and remainder of body, black. Gear, sulphur yellow, with clips, etc., black. Trimming, drab whipcord. Finish, lamps, rails, etc., black.

FOUR PASSENGER CART.

Scale, $\frac{1}{2}$ inch to the foot.

(See Fashion Plate No. 464.)

THE four passenger cart shown by Fashion Plate No. 464 is a vehicle that merits attention by builders of specialties. It is made as light as the load which it is to carry will permit, as it has ample capacity for four persons, two on the cross seat and two in the rear on the side seats, which are reached from the rear. The construction of the front and the attachment of the shafts follows the general ideas embodied in the front of the hansom. The body panel is perfectly plain, each side flaring about $\frac{1}{2}$ inch. The seat portion is fancy wicker work on iron frames. The dash may be covered with leather, as shown, or made of wicker work.

Dimensions of Woodwork.—Body, width across top, outside, 38 in.; across bottom, 36 in. Width of seat across top, outside, 52 in.; across bottom, 48 in. Wheels, wood hub. Height, 43 in. Hubs, length, 7 in.; diameter at center, $5\frac{3}{4}$ in.; front end, $3\frac{3}{4}$ in.; back end, $4\frac{1}{4}$ in. Size of spokes, $1\frac{1}{2}$ in. Number of spokes, 14. Stagger, $\frac{1}{2}$ in. Depth of rims, 19-16 in. Tread of rims, $1\frac{1}{2}$ in. Depth of bands, front, $2\frac{1}{2}$ in.; back, 1 in.

Dimensions of Ironwork.—Springs, 38 in. long between centers of heads, with $8\frac{1}{2}$ in. opening on main leaf. Width of steel, $1\frac{1}{2}$ in. Number of plates, 6. Thickness, Nos. 3, 4, 4, 5, 5, 5 steel. Axles, $1\frac{1}{2}$ in. Tires, $1\frac{1}{2}$ in. by 7-16 in., steel. Track, outside, 4 ft. 8 in.

Painting.—Body, black. Cane work varnished in natural color. Gear, red, striped with heavy line of black. Trimming, gray whipcord. Finish, lamps, rails, etc., black.

LADIES' PHAETON.

Scale, $\frac{1}{2}$ inch to the foot.

(See Fashion Plate No. 465.)

THE growing demand for driving vehicles specially designed for ladies has led to the production of many new styles, or modifications

of some of the older ones. The one shown by Fashion Plate No. 465 is very attractive, the original being the product of Brewster & Co., of New York. It was shown at last winter's Horse Show, and was admitted to be one of the most stylish vehicles that appeared in the ring, and stands as a model for this class of vehicles.

Dimensions of Woodwork.—Body, width across top, 47½ in.; across bottom, 32 in. Wheels, wood hub. Height, front, 28 in.; rear, 44 in. Hubs, length, 7 in.; diameter at center, 5¼ and 5¾ in.; front end, 3½ and 4 in.; back end, 4¼ and 4½ in. Size of spokes, 1¾ and 1½ in. Number of spokes, 10 and 12. Stagger, ½ in. Depth of rims, 17-16 and 19-16 in. Tread of rims, 1½ in. Depth of bands, front, 2¼ in.; back, ¾ in. Distance between center of axles, 75 in.

Dimensions of Ironwork.—Springs, front, 30 in. long between centers of heads, with 6½ in. opening on main leaf. Width of steel, 1½ in. Number of plates, 3. Thickness, Nos. 4, 5, 5 steel. Back, 37½ in. long, with 3½ in. opening on main leaf. Width of steel, 1¾ in. Number of plates, 4. Thickness, Nos. 3, 4, 4, 5 steel. Back cross, 30 in. long, with 3½ in. set on main leaf. Number of plates, 4. Thickness, Nos. 4, 4, 5, 5 steel. Axles, front, 1½ in.; rear, 1¼ in. Tires, 1½ in. by 5-16 in. Fifth wheel, half circle, 18 in. diameter. Kingbolt, 3 in. forward of center. Track, outside, front, 3 ft. 6 in.; rear, 4 ft. 4 in.

Painting.—Body, dark ultramarine blue. Molding, black, no striping. Gear, ultramarine blue, a shade lighter than body, striped with a ¼ in. line of light drab color to match trimming. Trimming, light drab cloth. Special features are soft driving cushion, two foot cushions; lace facings, four pleats to fall and grain leather flap on dash.

FAMILY WAGONETTE.

Scale, ½ inch to the foot.

(See Fashion Plate No. 466.)

FASHION PLATE No. 466 illustrates a wagonette designed for family use. It has ample accommodations for six persons inside and two on the front seat. The body is given a shortened appearance by the back end being swelled. The side has a turnunder of 1½ in. The body is 54 in. wide, the front seat 37 in. on the cushion bottom. The glasses in the sides and door drop level with the guard. The gear is a three spring perch.

Dimensions of Woodwork.—Body, width across at top, 54 in.; across bottom, 49 in. Width of front seat at stanhope pillar across top, 45 in.; across bottom, 30 in. Width across front of boot, 30 in. Turnunder, 2½ in. Wheels, wood hub. Height, front, 34 in.; rear, 44 in. Hubs, length, 7 in.; diameter at center, 5½ and 5¾ in.; front end, 3¾ and 4 in.; back end, 4¼ and 4½ in. Size of spokes, 1½ in. Number of spokes, 12 and 14. Stagger, ½ in. Depth of rims, 1½ in. Tread of rims, 1¼ in. Depth of bands, front, 2¼ in.; back, ¾ in. Distance between center of axles, 64 in.

Dimensions of Ironwork.—Springs, front, 36 in. long between centers of heads, with 7 in. opening on main leaf. Width of steel, 1¾ in. Number of plates, 5. Thickness, Nos. 2, 2, 3, 3, 4 steel. Rear, 37 in. long, with 8 in. opening on main leaf. Width of steel, 1¾ in. Number of plates, 5. Thickness, Nos. 2, 2, 3, 3, 4 steel. Axles, front, 1¼ in., fantailed to 1¾ in.; rear, 1¾ in. Tires, 1¼ in. by 5-16 in. Fifth wheel, 14 in. diameter. Track, outside, front and rear, 5 ft.

Painting.—Body: Seat, belt panels, stanhope pillars and brackets painted an amber brown. The remainder of body, including the main lower panels, is black. Moldings black, striped with a fine line of light amber. Gear, dark amber, striped with black. Trimming, light Bedford cord. Finish, rails, etc., black.

GOLDEN GATE BUCKBOARD.

(See "Latest Styles.")

PLATE XLI. represents a light buckboard, built by the Waterloo Wagon Co., Ltd., Waterloo, N. Y. The general appearance is up-to-date, while the suspension is such as will insure comfort to the occupants. It is finished in natural wood, with silver bronze iron work, or in quiet colors, trimmed with whipcord, Bedford cord, or cloth.

CANOPY TOP SURREY.

(See "Latest Styles.")

PLATE XLII. represents a canopy top surrey, built by the Wolverine Carriage Co., Pontiac, Mich. The body is cut low, and thus affords easy access to the seats; these are large and commodious, and the high, full squabbed backs insure comfort to the rider. The canopy top affords protection from the sun's rays, but may be removed if desired. The vehicle is one that can be profitably handled by dealers.

ONE MAN ROAD WAGON.

(See "Latest Styles.")

PLATE XLII. is one of the best illustrations of the typical one man road wagon that we have seen. It is one of the celebrated road equipments of the late Colonel Kip, the wagon being a high wheel bolster, one man vehicle, and the horse one of the beauties of the road, "My May." The opportunity of illustrating so handsome an outfit is seldom offered, and we feel that our friends will appreciate the illustration of this purely American turnout for gentlemen drivers.

DEMI-MAIL PHAETON.

(See "Latest Styles.")

PLATE XLI. illustrates the demi-mail phaeton, and the great team, "Hi" and "High Tide," shown last fall by the late Charles F. Bates. Mr. Bates had few equals in fitting out gentlemen's heavy pleasure rigs, and the fine condition in which they were shown went far toward his winning so many blue ribbons. This is a representative turnout of its class, in vehicle and in harness, as well as in team. Mr. Bates occupies the seat.

AN APPRECIATED COMPLIMENT.

THE April issue of THE HUB is a special dealers' and export number of nearly 100 pages. The publication shows every sign of intelligent management and prosperity. It is the mouthpiece of one of our great industries, being devoted to the domestic and foreign interests of carriage, wagon and automobile manufacturers and dealers and the accessory trades. The automobile department of the present number is especially good, the illustrations being far above the average.—*The New York Press*, April 21.

BACK NUMBERS OF "THE HUB" WANTED.

WE want five copies each of April, July, August, 1897; April, May, 1898, and February, 1899. issues of THE HUB, for our files. To anyone sending us any or all of above numbers we will send receipt for subscription to THE HUB for three months for each number received in good condition. Be sure to put your name and address on package, and prepay express charges if they are sent that way.

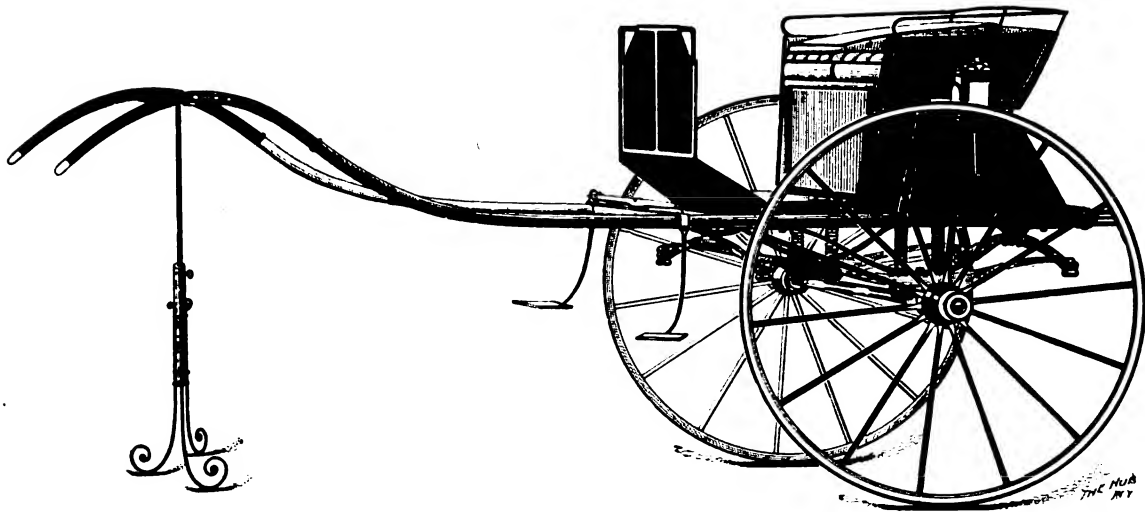
TRADE NEWS PUBLISHING CO.

24-26 Murray Street, New York.

"THE CARRIAGE BUILDER."

INDIANAPOLIS, Ind., is the home of another carriage journal, *The Carriage Builder*, which the editor promises to be "not like any other carriage paper published." The first number is largely made up of clippings from other journals, but as the readers are asked to contribute for each department we may expect a different condition hereafter. No. 1 contains a fair amount of advertising patronage, and the general appearance is favorable to success, but having had some experience in carriage trade journalism, we are prepared to assure the publisher of a new journal that there is work enough ahead to satisfy the hardest hustler. We welcome our new contemporary and are ready to extend a helping hand, and we wish it success, as we believe the trade is advanced by the diffusion of technical and general information by the journals that represent it.

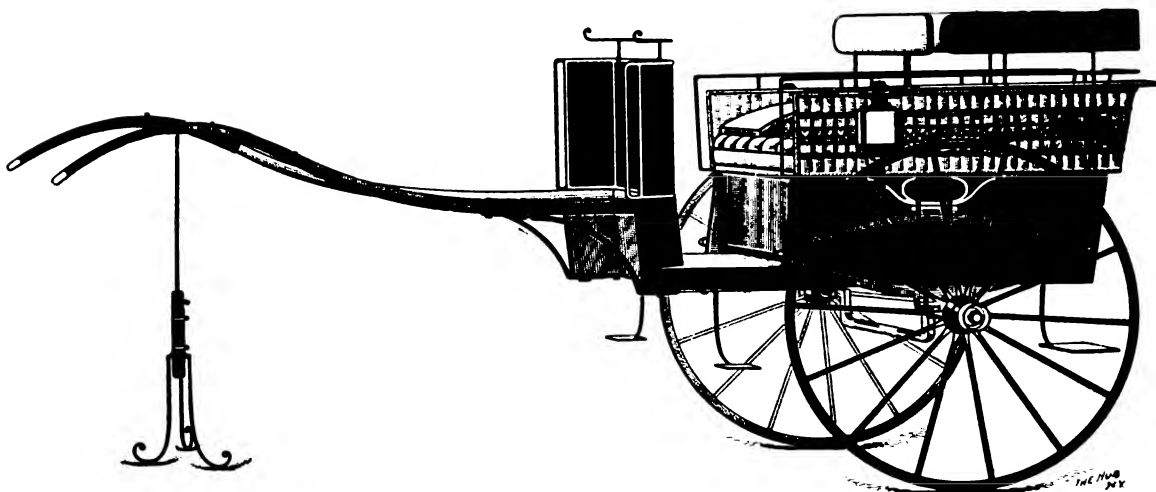
Latest Styles. May, 1900



No. 463. GENTLEMAN'S DRIVING CART. Scale, One-half Inch.

See description under "Latest Styles" in this number.

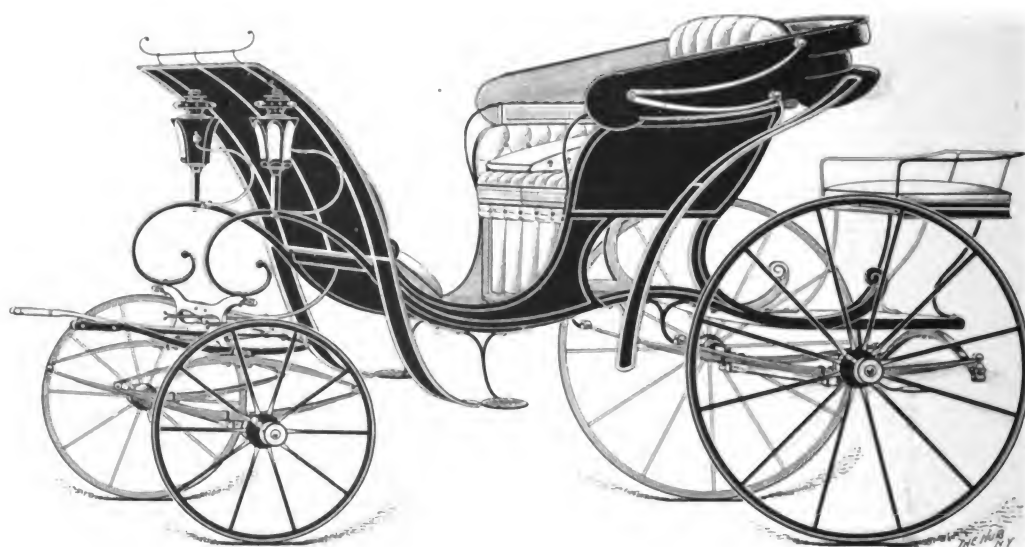
(Electrotype, \$1.25.)



No. 464. FOUR PASSENGER CART. Scale, One-half Inch.

See description under "Latest Styles" in this number.

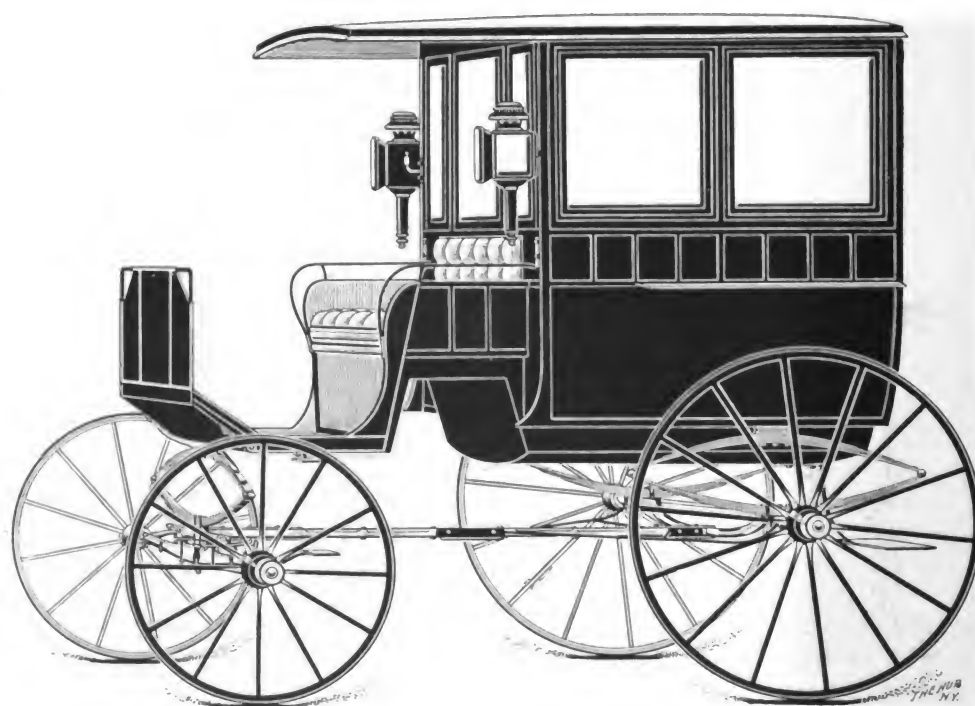
(Electrotype, \$1.25.)



No. 465. LADIES' PHAETON. Scale, One-half Inch.

See description under "Latest Styles" in this number.

(Electrotype, \$1.25)



No. 466. FAMILY WAGONETTE. Scale, One-half Inch.

See description under "Latest Styles" in this number.

(Electrotype, \$1.50.)

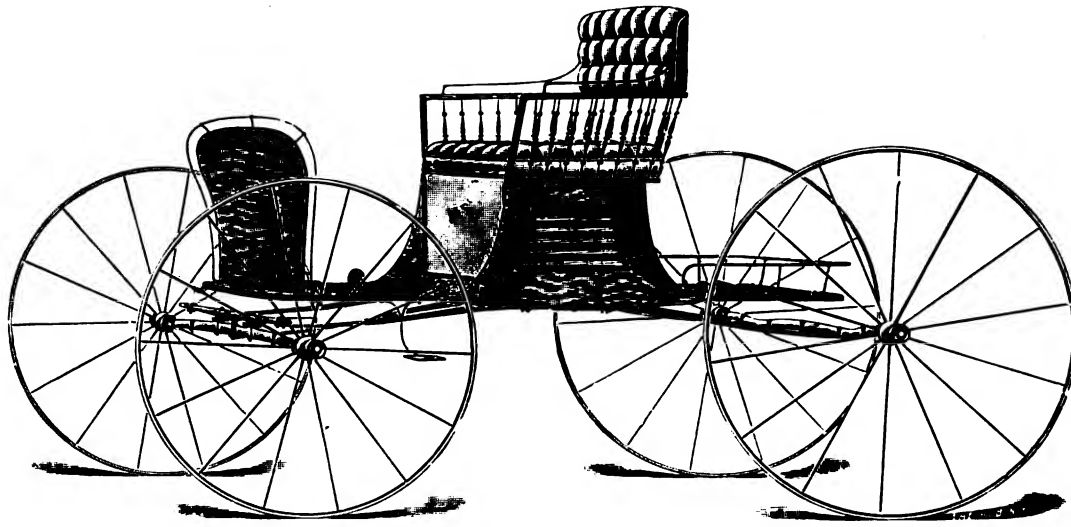


PLATE XLI. GOLDEN GATE BUCKBOARD.

See description under "Latest Styles" in this number.

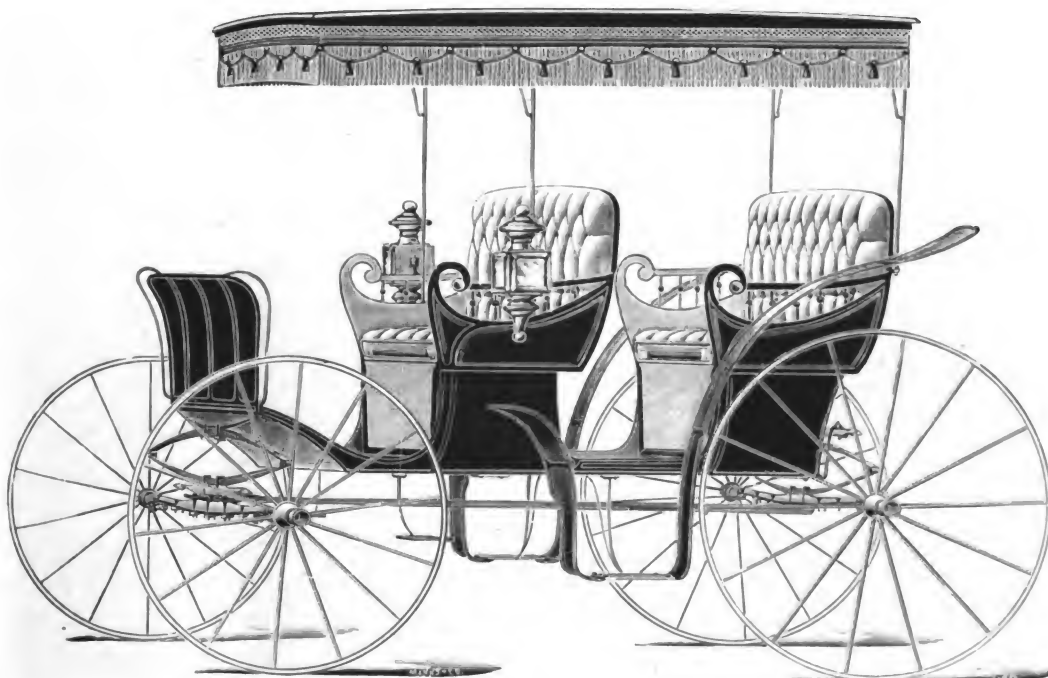


PLATE XLII. CANOPY TOP SURREY.

See description under "Latest Styles" in this number.

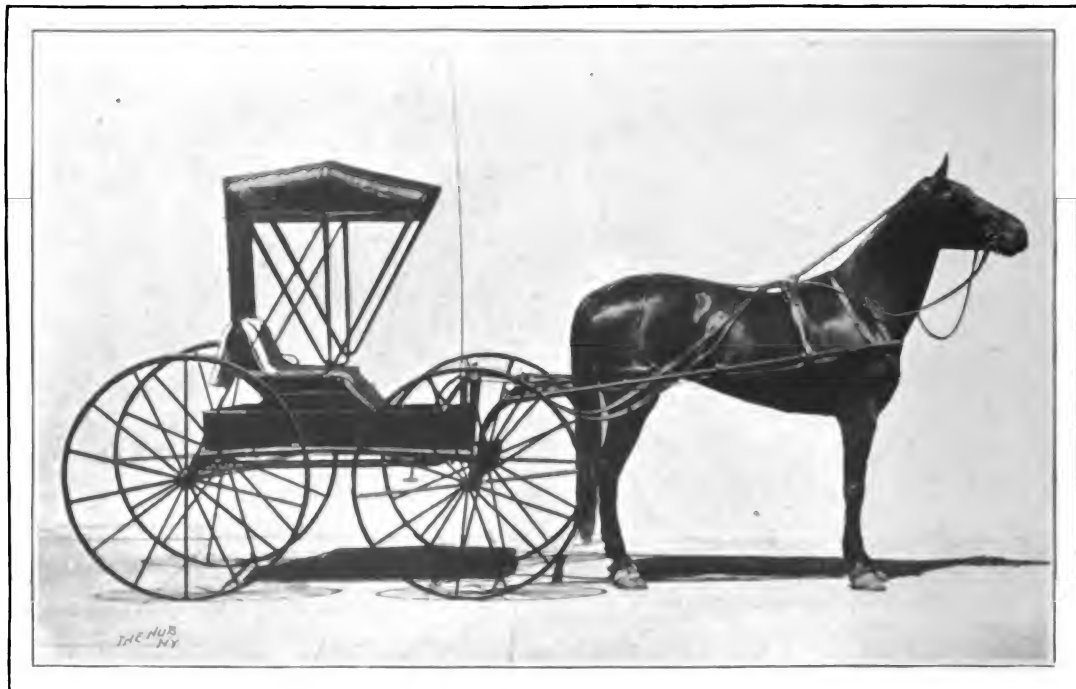


PLATE XLIII. ONE MAN ROAD WAGON AND THE LATE COL. KIP'S ROADSTER, "MY MAY."

See description under "Latest Styles" in this number.

(Electrotype, \$2.00.)

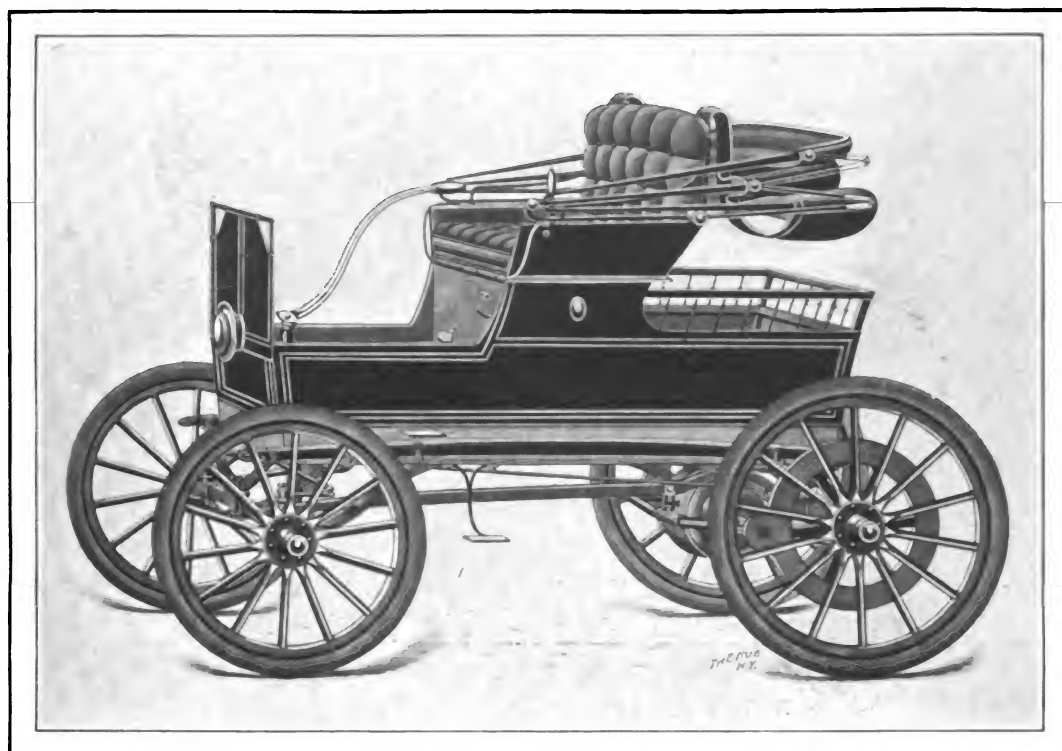


PLATE XLIV. DEMI-MAIL PHAETON, WITH THE LATE C. F. BATES' GREAT TEAM, "HI" AND "HIGH TIDE."

See description under "Latest Styles" in this number.

(Electrotype, \$2.00.)

AUTOMOBILE ILLUSTRATIONS.



AMERICAN ELECTRIC VEHICLE CO.'S SIDE-BAR BUGGY.

For description, see Automobile Department.



CLEVELAND MACHINE SCREW CO.'S PHAETON.

For description, see Automobile Department.



NEW ENGLAND MOTOR CO.'S PHAETON.

For description, see Automobile Department.



WAVERLEY DOS-A-DOS.

For description, see Automobile Department.



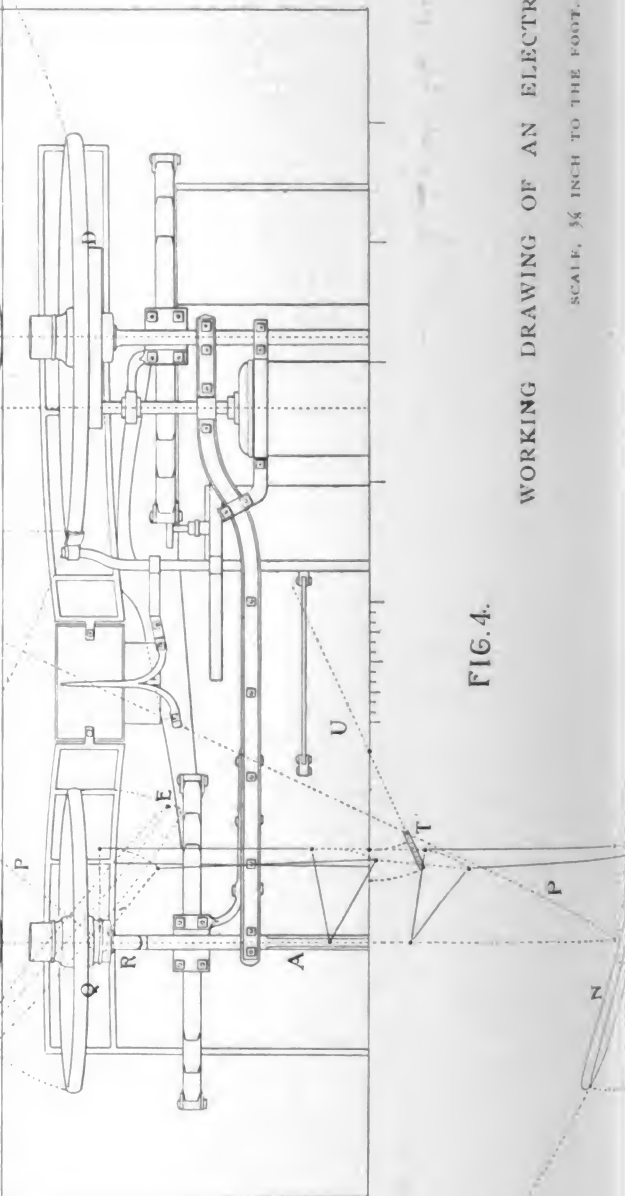
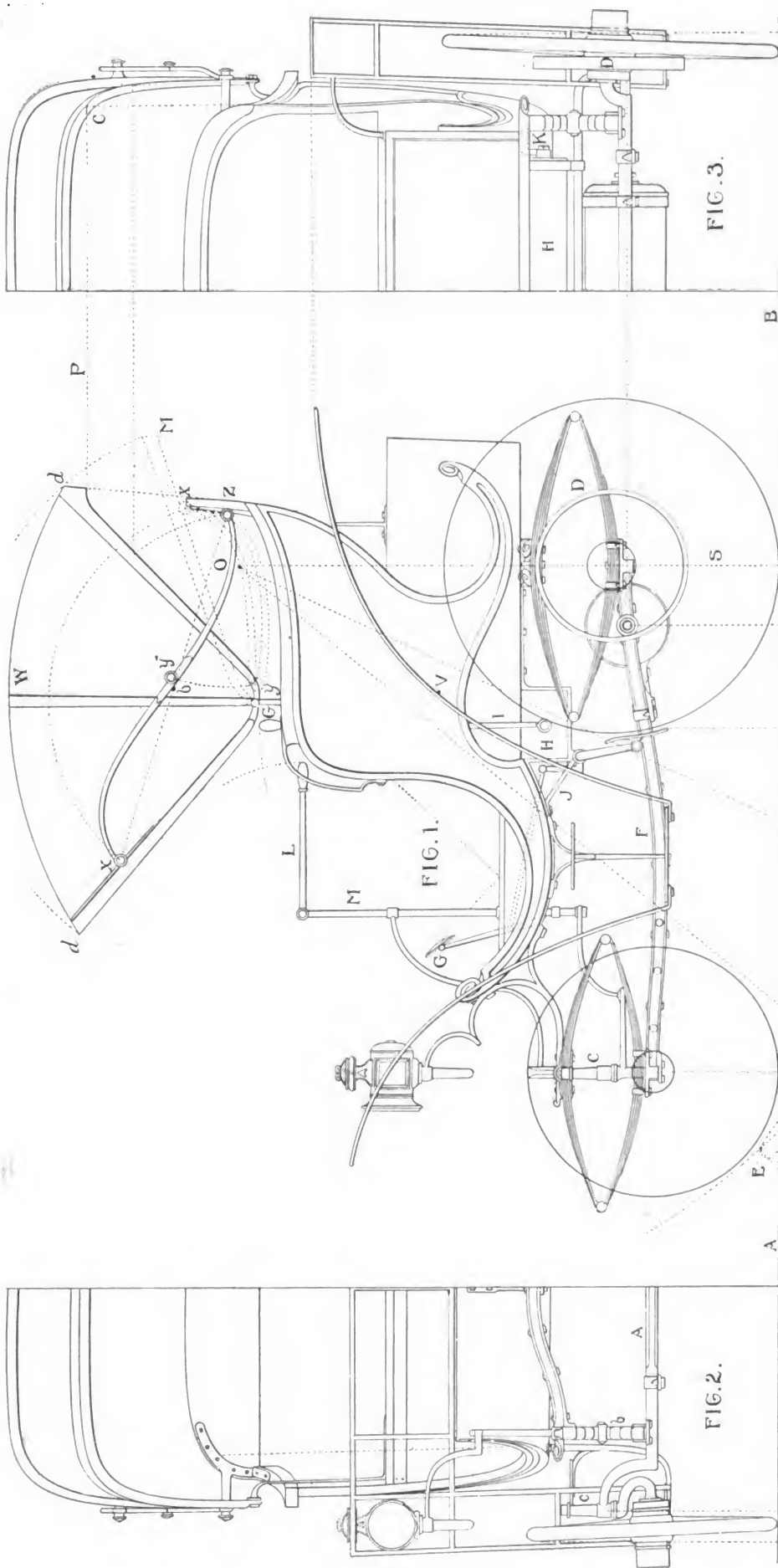
CENTURY MOTOR CO.'S CARRIAGE.

For description, see Automobile Department.



DE DION-BOUTON GASOLINE CARRIAGE.

For description, see Automobile Department.



WORKING DRAWING OF AN ELECTRIC PHAETON.

SCALE, $\frac{3}{8}$ INCH TO THE FOOT.

Wood Department.

WORKING DRAWING OF AN ELECTRIC PHAETON.

Scale, $\frac{5}{8}$ in. to the foot.

THE working drawing on page 58 illustrates a design for an electric phaeton for two persons, fully equipped with all the appliances that tend to the pleasure and convenience of the rider. The noticeable feature of the drawing, Fig. 1, is the nearer approach, in the design of the body, to the original conception of the phaeton, and in this particular it is a conspicuous exception to the one fault so noticeable in the construction of automobiles, all of which look like the work of the mind and hand of one not accustomed to carriage drafting. Take, for instance, the electric stanhopers; they are practically the same in the lines leading up to the top, nor are they really stanhopers as originally built. They are more like the T cart, or mail phaeton body than anything else; but in this drawing we come as close to the phaeton as the equipment of the carriage will allow.

The front elevation, Fig. 2, shows the width and position of the axle, the clipping on of the spring, the form of the perch, shape of the arched bar, which is clipped to the top of the springs, the position of the lamp, design of both dash and wing, width and contraction of the front of the body, which is necessary, because the width of the back end of the body is much wider than the front end, all of which must be shown in the working drawing of the body of this phaeton. The track is 4 ft. 10 in. The swing of the wheel is in a height of 30 in. $1\frac{1}{2}$ in., in order to have the vertical spindle as nearly over the tire as possible. The mechanic can see that the principle by which we are guided in the work is the rational one in setting the axle. The weight which is on the axle A, Fig. 2, through the spring b, will keep the spindle c, in the vertical position at C in the side elevation, Fig. 1, because if it moves it must twist the axle A, which on a $1\frac{1}{2}$ in. axle is not probable, although possible in an accident. The pivotal axle for the front wheels is, according to the best mechanics, a solution of the problem of steering or guiding the direction of the carriage, identical with the principle of steering a boat or ship, and is, as we now know, exactly opposite in both principle and method of that with the horse propelled carriage, because if we do not pivot the front wheel to the main axle A, Fig. 2, we must swing the wheel, axle and spring from a centric point placed either in the axle itself or directly above or directly below that center, but to cover the whole ground we may station this center back of the vertical plane of the transverse axle. We may transpose this pivotal center along the longitudinal axis of the horizontal plane to any convenient point, at the option of the draftsman, and when we do not pivot the wheel to the main axle by means of the "wim-wam" we must sacrifice the position of the step and wing of the front wheel, and at the entrance of the carriage we must consent to the resultant inconvenience which would follow; hence we indorse the pivotal front wheel as a means of steering the carriage in the most reliable manner. We can, if driven to it, steer the direction of the carriage from the hind wheels, but if we look into the matter we will soon discover the folly of such a decision, as it is better to distribute the intricacies of the mechanism of the running gear to a back and front position, so as to obtain room for each particular part, and thus divide in proportion the work for each end, and for each wheel and axle. In this way there will be space on the axles for the motor, spring, brake, perches, and for the steering gear, and we can then proceed to model a design that will be acceptable, but whenever we undertake to place all on either axle, then we have the spectacle of an over balanced model, an airy appearance at one end and a bulky load at the other, an incongruity that places all of the weight on one axle, leaving nothing for the other to do, and the absurd situation is conspicuous to the untutored which already is condemned by the carriage builder, and it is safe to say that, as a rule, the appearance of the pleasure carriage is the first consideration of the builder. If the appearance of the carriage does not suit the purchaser he will take an unusual long time to decide about possessing it. An ugly, badly shaped, badly proportioned carriage is a detriment to both builder and purchaser; there is no excuse for building an ugly appearing electric carriage.

Fig. 3 shows the elevation of one-half of the back, mounted on a drop axle of $1\frac{3}{4}$ in. square steel, to which is clipped the spring to

solid forged square shaped flaps, spread to an outside width of 43 in. The track of the wheel is 4 ft. 10 in., having a swing in the height of 40 in. of $1\frac{3}{4}$ in. To the axle is first fixed the rear end of the bent hickory perch, plated top and bottom, the ends of the plates passing over and under the axle, and clipped and bolted. The cylinder of the motor is secured to the perch and axle, the armature of which is geared to a cog having the slots cut on the interior surface of the rim D, Fig. 1, and not on the outside, as usual. This driving wheel is then clipped to each alternate spoke of the hind wheels. The center of the cog D is bored for a 6 in. hub, over which it fits. The outside surface, which is spoked as that of the wheel, coincides with the inside edge of the wood spokes of the coach shaped wheel, and we may in the finished work of the carriage fix to the axle a dust plate, which will conceal and protect the gearing cogs of the armature and driving wheel; it will be necessary to know that it must be clipped to the axle, since the dust plate cannot revolve with the wheels. As it envelops the cogs of both, the cross position of the armature will dispute the way.

A projection in plan of one-half of the carriage mounted is shown by Fig. 4, as in the elevation. It is upon this that we make clear to the reader the form and the position of the parts shown in Figs. 1, 2 and 3. It is a projection derived from the length, width and height of the elevations above it, hence it is stationed upon the horizontal plane, supposedly directly under Fig. 1, the side elevation, with the base line A B forming the edge of intersection of the vertical with the horizontal planes. This is not always the rule in automobile building; on the contrary, machine draftsmen arrange the plan above, instead of below, a situation which is both faulty and inconvenient, especially to a carriage mechanic, because in the first place there is more work on the plan than there is in either or all of the elevations; secondly, the ground upon which we consider to be a horizontal surface, is below the side; we cannot conceive of its being above, like the ceiling of a room. It is absurd to suppose that the vertical and horizontal axis of the drawings could ever intersect under such an incongruous arrangement of the plate.

We have drawn in plan the near side of the carriage, coinciding with the elevation, Figs. 1 and 2. In this plate we can clearly see the fixing of the motor to the axle and the perch, which is done in the best manner possible. Expense at this point should not be the first consideration, but instead the work must be so done that space is both used and economized, making the two perches contribute to the stability of the cylinder, and the braces which support the armature to strengthen the perches. Bend the perch F, of either hickory or ash, out of $1\frac{3}{4} \times 2$ in. stock; the ends abut the front and back axles. The plates, top and bottom, form the clip and yoke for its fixture to each axle alike. Take advantage of the close proximity of the solid spring flaps to turn off a brace from the bottom onto the side of the perch at the front, and to the bottom at the back, the latter being fixed with a clip, the former with bolts; this latter brace from the hind spring forms a box, within which the armature revolves. The bushing should be of brass, the wear to be taken up by means of a taper key. We can judge of the simplicity of the work, since we employ the use of the spring flap and the clips, which secure the springs, and which also fix securely the braces which support both perch and motor. In this way we avoid a great display of irons that would not be as good nor look as well, and which require a great deal of labor.

On this drawing is produced a reliable form of brake, one that is intended to stop the movement of the wheels in the shortest time, and with the minimum of exertion. The drawing shows that the shortest distance from the toe pad to the tire of hind wheel is from the shoe to the rod at G, Fig. 1. The shoe should be made of a thin plate of steel, shaped as shown in the side view, concaved slightly to friction with the rubber cushion of the wheel, and placed below the center of axle to obtain this friction without the vibration which would accrue if placed above that point. When this is done, if the weight lowers the body the brake shoe will travel away from the cushion of the wheel, but a half inch of motion at G will move the shoe towards the tire twice the amount, overcoming the loss without losing the pressure on the tire of the wheel. The square box H contains the controller, by which with the lever bar I the current is fed to the motor, and by which the carriage is started. The brake is the only means of stopping the motion when this current is turned off. The controller is held in the position shown by the braces, which are also made to take the main cross rod of the brake. The place for this controller is the top when the cells of the batteries are removed. This controller is stationary, and when once fixed to the carrying crane need not be tampered with, as trouble is not likely to happen except

through accident. These irons are bolted to the bottom of the floor, which is of hard wood, one-half inch thick, but the brace J, which is the main stay of the brake rod, is bolted further out toward the shoe to the sills of the body. The reason why this controller is set in under the body in this position is to avoid interference of the spring; furthermore there is no room for it in the usual place on the seat; the controlling bar I is mortised through the bottomside.

The steering gear, by which we guide the carriage in any desired direction, is arranged so that if the handle bar L, Fig. 1, is swung to the right the carriage will turn to that direction, the driver's position being on the near side of the carriage; the steering bar M stands in the center. The brake rod is stationed 6 in. from the center, and toward the near side. The distance which the handle end of the bar L will swing to either side is 8 in.; the length is 18 in. The handle is set above the seat bottom 10 in. The ground space in which the carriage will turn is 24 ft., as the distance from the front wheel N is 12 ft. to the common center O, to which point in the vertical plane of the hind axle, prolonged for this purpose, is directed the square of the two front wheels, in a position locked to turn around the center O, as shown by the two dotted lines P P. To arrive at a correct knowledge of the plan of the steering gear, turn the front wheel Q in the position E E, as backed against the spring, the limit of the angle, which revolves about the center R. If through the center R we draw the line P at right angles to the chord E E, prolonged until it cuts the line S, the center of hind axle, the intersection thus found will be the point around which the carriage will turn. The first question which the mechanic asks is, "Is this the correct answer?" It is, because each wheel stands at right angles to this point, and a line drawn from the center of each wheel, as here clearly illustrated, will be at right angles to the rim of the wheel, and the longer the carriage is coupled up the greater will be the distance from the points E E to O, and the longer will be the lines P P, and the more will be the space required in which to turn, conditional that the degree of angle of the front wheel Q is not increased or diminished, as this angle is the starting point, as described above. It is necessary to find the direction of the two lines P P before we can describe the movement of the rods and pivots, and the distance that they will move on the steering gear, as shown in plan, locked in the position to which they must move when the wheel Q is backed, as it were, against the elliptic spring, which in practice we do not propose that the rubber tire shall quite touch. The drawing is quite plain on this point, and the reader can inform himself of its accuracy by the use of a pair of dividers. We mention that at the point T, Fig. 4, a slot is cut in the end of the rod U, which is necessary to a smooth working mechanism and also avoids the necessity of adding the more complicated device of a hinge method of movement. We have seen several kinds of steering gears, but none more simple or accurate than this, but no matter the kind used the principle here shown and explained is present in all, because the wheel N travels in a larger circle than either of the other three, hence the angle to which the rods of the steering gear will turn this wheel is much less than the wheel Q, but the principle here laid down is present in the locking of all carriages, whether horse or motor propelled. But to end the matter we have only to place one point of the dividers upon the center O and extend the other to the rim of the wheel Q, and it will cut the points E E, and likewise the wheel N, as well as the hind wheel; this is the correct answer to the question involved.

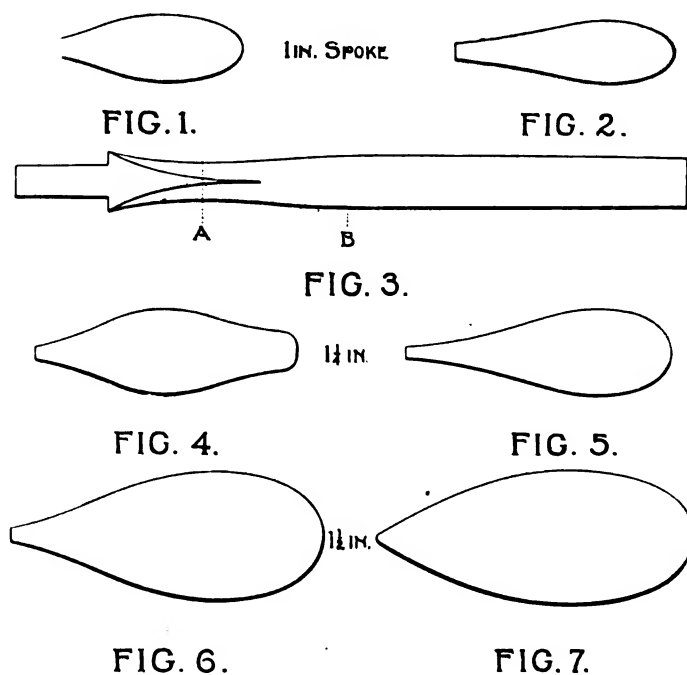
The drawing of the top and all that goes with it is governed by rules that should be known in order to do good work. A technical knowledge will not conflict with the practical shop work, whereas it is indispensable if we wish to make a draft of the top. In some shops the carriage is ironed and the bows are screwed on, the top set and length of joint found, and the smith then makes the side joints from the measures given by the trimmer.

In setting the top, set the middle bow at the center 3 feet 9 in. above seat bottom, extend the back bow 2 in. beyond the vertical plane of the lazyback, and from this to the front bow on a straight line is 54 in., and in order to give a square poise to the contour of the top, set the back bow $2\frac{1}{2}$ in. higher than the front bow, as in the two points d d, Fig. 1, then find the center at V, and describe the sweep W. Place the center of the goose neck G in such a position that it will be equally distant from the points d d; from this point the front and back bows will be of equal length, insuring a good appearance when the top is folded back. Then station the elbow prop as at Z, and from the center G turn the front bow to the position M, as per dotted lines, and on the edge station the top prop a trifle back of the elbow props, as shown at X', and also station the same on the front bow as at X, and from Z to X produce a straight line, as dotted in, and proceed to find the point of knuckle b', the center of the dotted

line from Z to X. Then draw a straight line from Z to X, at the elbow to the top prop of the lowered front bow, divide this line into three parts, take one part and place it from b' back to the knuckle, and it will be the point desired, as shown on the drawing; then decide the shape of the side joint, which is done as follows: From the center Z describe the center of the knuckle from y to y', fixing the knuckle on this curve, as near midway between the top of the lowered front bow and the arm rail as possible; then from the elbow Z to the knuckle y' draw the lower half of the joint corresponding to the curve of the arm rail, and from the top prop of the lowered front bow at X' to the knuckle y' draw the top half of the side joint corresponding to the curve of the lower half of the side joint, as shown in Fig. 1, and when the joint is open the shape will be as shown in the compound curve Z to X. This is the practical way of finding the true shape of the side joint, so that the curves of the joint in the folded top may correspond. If we design a side joint to look well when in an open position, without reference to its folded position, we carry the point of the back bow at the height of the line P" across to the back elevation, Fig. 3, and from the width of the lazyback erect the vertical line C" to where it cuts the line P"; the intersection will be the point of projection to the back bow, as shown in Fig. 1. If we take the point Z of the elbow prop, and describe this point from the center G, the goose neck, until it cuts the back bow, and from this point horizontally across to the back bow of Fig. 3, and then vertically down to the elbow prop, we obtain the length of the back bow when lowered onto the prop.

THROATING SPOKES.

THE old time wheel maker, who worked out his spokes by hand, took quite as much pride in the form given to the spoke, particularly at the "throat," as he did in the construction of the wheel, and the beauty of the wheel was enhanced thereby. Elasticity at that

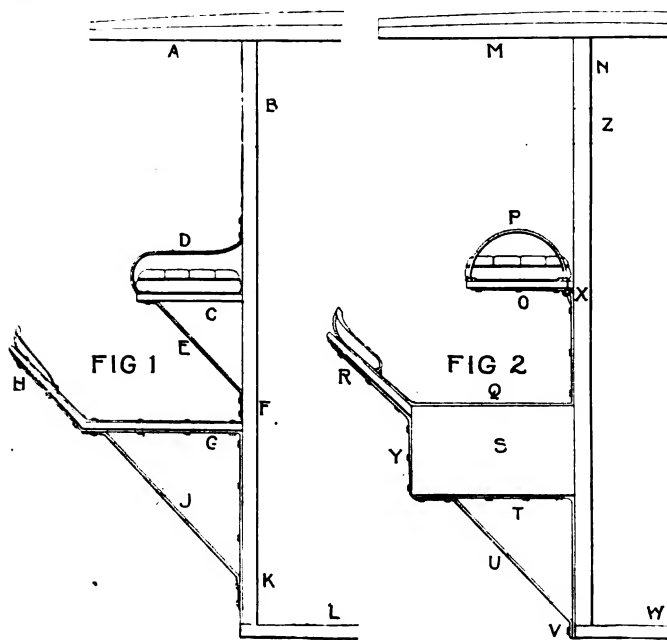


point was desirable, and in very light wheels the two forms that met with the most favor were those shown by Figs. 1 and 2, as they would appear cross sectioned at A, Fig. 3. For a heavier spoke the forms 4 and 5 best represent the form, while 6 and 7 show the form for heavy spokes. In rounding Figs. 1 and 2 the swell between the shoulder and the point A took no more swell than was absolutely necessary to retain the relative form; above A it gradually increased in the center, until it reached the point B, Fig. 3, where the full form of the spoke was reached, being modified to work in without creating a decided point of contact, whether the upper finish was oval, round, or other shape. In 4 and 5 the fullness was necessarily increased, and yet the throat was thinned. In 6 and 7 the spoke was not reduced at the throat, but was cut away on the back and front, to the required form. The throating machines of the present day have done away with the necessity of hand throating, but there is nothing to prevent the machines being fitted to cut any shape that may be desired. There are many, however, who do not purchase their spokes fully finished, and to such these patterns may prove valuable.

Smith Department.

IMPROVED SEAT FOR MOVING VANS.

If there is a driver of any vehicle who has a just complaint against the carriage or wagon builder it is the driver of the moving van. The average builder of the modern "land ship" for conveying household goods and chattels wastes all his abilities as a modern constructor to produce extensive panels and an increased exterior capacity. Anything and any place is good enough for drivers so long as they can hold on. No matter whether it is the van made to-day or the one first evolved (about eighteen years ago), there has been no change in any particular so far as relates to the driver, light in the interior or a matter of ventilation. The driver and his help sit in the same cramped position to-day that they did when the van was first made. With vicious, fractious or peevish unmanageable horses his chances for finding himself on the pavement or roadway, or some one else finding him there, are quite as good to-day as ever. In rain or frost his chances for a wetting or a freezing are quite as good to-day as they have ever been, "which is getting there the best you can," and thus we might go on and fill up the whole of this number with complaints which we hear nearly every day and have heard for years, complaints which have not apparently reached the ears of the van builder in the right direction, but which no doubt have been left for us to throw at the van builder "*noletns volens*."



OUTSIDE SEATS FOR MOVING VANS.

Having entered the complaint, we will now set forth as plainly as possible the best remedies we know of to cure the cause of the complaint.

Fig. 1 shows the front of the average van as now made; A, section of roof with its front projection; B, front pillar; C, seat frame; D, seat rail; E, seat leg secured to front pillar at F; G, foot board; H, bracket board; J, bracket stay secured to body at K; L, section of rocker or sill. The seat rail is secured to the front pillar, as also is the seat.

We will begin with the admission of light to the interior and the matter of ventilation. (See Fig. 2.) For light, place in the front panel, on a line with eyes of the driver, a round light about 4 in. in diameter or a square one of about 4 in. on all sides. Let the same be of plate glass not less than $\frac{1}{4}$ in. thick. These will admit all the light necessary at the front, and at the same time give the driver and his helper a good opportunity of looking in the van to see if everything is O. K. The contents of vans occasionally take fire, and before the driver or his help is made aware of the fact there is nothing left to do but cut the horses loose and let the old thing burn.

Ventilation is not absolutely necessary, but if a van with its load has been driven ten or more miles with the vertical rays of a June, July or August sun beating down on the roof, there is sure

to be more or less vitiated air in the body of the van. The best and easiest mode of ventilation would be to insert three or four pieces of gas or steam pipe in the bottom at the front, giving them an opening at the bottom and through the bottom of the van. The calibre of the pipes should be about 1 in. These would let in a sufficient amount of cold, fresh air, to force the expanded and heated air on the outside out of half a dozen inch openings at the back of the vehicle body near the top, so constructed as to not permit of the entrance of rain or snow. A van furnished with such means of ventilation would cut off nearly all possible chances of spontaneous combustion.

Now having said all we think it necessary to on the matter of light and ventilation, we will take up the matter of the consideration of those who navigate these great big land ships, and in doing so refer the reader to Fig. 2, which is somewhat similar in appearance to Fig. 1. Fig. 2, front section of the roof and the portion that projects, forming a hood for the protection of the driver. N is the front pillar; Z has already been explained and therefore needs no further notice in this chapter; O is the seat frame, P is the seat rail, Q is the foot board; R, the brackets; S, end panel of what we will call the boot; Y, front panel of the same; T is the bottom of the boot, U is the boot and bracket stay; V shows where the same is secured to the front pillar; W is the sill or bracket.

In Fig. 2 the roof has about 3 in. more front projection. The seat is made two or more inches wider and is so secured to the body. The seat is wired on the bottom and secured to the outside corner posts and the center post as at X X, by means of three strong hinges placed on the top of the seat, and so connected and fitted as to permit the seat being turned up against the front panel. The seat rail is hinged near the seat and so made as to turn down onto the seat when the cushion is removed, so as to permit of the turning up of this seat. The cushion is secured to the front of the seat by means of a harness leather hinge which permits of it being held in suspension when this seat is turned up and held fast by the necessary securing agents. The foot board, Q, is so made as to project over the end panel of the boot about three inches on each end, so as to form a step in mounting the boot. The foot board is hinged onto the bar forming the base of the bracket. With the seat turned up against the front panel and the foot, and the foot board turned over against the bracket, it can be readily inferred what a comfortable place the boot is to stand in cold weather, provided there is plenty of straw in same. Then aside from this, the control over the horses which is given the driver more than compensates for the trifling extra expense. Another item is the ease and economy with which a rubber cloth apron may be fitted and adjusted to the bracket and the front panel, which would completely protect the driver and his assistants from the worst kind of a storm. At a trifling expense a storm seat could be fitted so as to use when using the boot, so that the driver and his help could rest in a partly sitting position. The increased width of the seat and the fact of it being elevated in front lends aid to the security of those occupying the seat. In addition two handles are placed on each side, and an additional step on each side would cause the driver and those who help him to sound the praises of a man who could and would so build the front part of a moving van as to cause those who manipulate it to say: "Well, life is now worth the living."

IMPROVED MANAGERS FOR FRONT OF TRUCKS.

THE style of "Manager," "Monitor," front, or whatever it may be designated by, is much the same to-day as it was forty or more years ago. A change is needed, and will prove of much benefit and lend security to the part designated if instituted as we prescribe. The present style of managers, which consists of two rungs framed into the front bar and secured to the same by means of an ordinary T plate, is another piece of vehicle furniture which requires to be relegated to the past. The mortising of the front bar necessarily weakens the same, forms a receptacle for water, and in two or three years rotten wood can be found at that section. After the first year the managers are not equal to the strain put upon them. We know of many serious accidents which have occurred because of faulty managers, which might be avoided if made as follows: First, do away with the managers and the mortising, and use T iron as shown in detail in Fig. 1. A shows the flat side of the T iron, B shows the web. For an ordinary two ton truck the T on the flat part ought to be $2\frac{1}{2}$ in., which would make a web $1\frac{1}{4}$ in.

Cut the pieces long enough to form your stand, on the manager, allowing it to extend down to the bottom of the front bar with the web intact. At a point even with the bottom of the front bar remove the web, and leave the part from which the web is removed long enough to turn under the full width of the front bar. Then take a piece of flat iron quite as wide as the front bar, and as thick as the flat of the T iron. Upset and leave flat the end of the T iron, from which you have removed the web. Also upset the other piece at the center as much as it will waste in welding, then raise

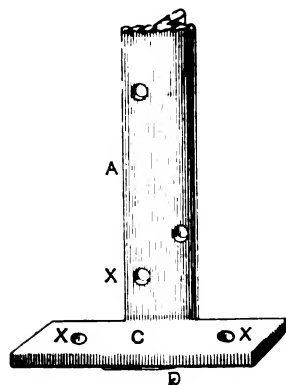


FIG. 1.

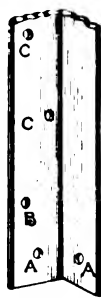


FIG. 3.

a welding heat, and weld the plate of the T iron on the flat side. When properly welded and finished turn, and for the angle proceed as per C, Fig. 1; this will bring the part of the T iron welded underneath to C, as at D. The part C ought to be about 8 in. over all. Secure to the front bar by means of vertical bolts passing through holes X X X X; also secure the front bar by means of a horizontal bolt passing through the hole X at one side of the web. Use for this weight T iron 7-16 in. and ten bolts. After the bolts as per hole X are in position, proceed as explained in next paragraph and illustrated by Fig. 2.

Fig. 2 shows sections of the standards; A and B show an angle iron corner plate which extends all the way across the front of the body and is secured to the front bar and the standard by means of bolts passing vertically through holes X, Fig. 2, also the front bar managers and corner plate to the front bar, and are aided by as many bolts as may be necessary for perfect security, one bolt at each end passing through the sills. The better securing of the standards to the plate is done by horizontal bolts passing through the holes A, Fig. 2, in the standard and in the corner plate. The holes in the vertical part of the angle not designated are for the purpose of securing the front board when one is required at the bottom. The angle iron for this class of weight of truck ought to be not less than 3½ in. wide.

Fig. 3 shows a piece of angle iron of the same size as the bottom corner plate, which is necessary only when the front board extends all the way across. Secure it to the sill and front by means of ½ in. lag screws per holes A, and to bottom plate by means of a bolt through hole B. The holes C are for securing the front board to vertical corner plate, Fig. 3, by means of bolts, or ring or hook-

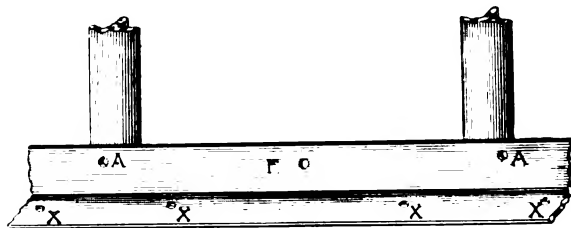


FIG. 2.

bolts, as may be desired. If a hinged seat is to be used, then the end must be as per drawing. If no seat is used pieces of wood may be cut out to suit the web and extend above the standard on a finish to suit, bolting the same to the standard. If a windlass is to be affixed to the point, then put on front two additional standards, same as Fig. 1, only as high as necessary and as close to the original standard as possible on such side as is the most convenient. Use 7-16 in. bolts for all.

HEALTH is a loan at call.

Paint Department.

COLORS FOR THE SEASON OF 1900.

WHILE fashion does not make radical changes in colors for each season, it does recognize the fact of such changes, and gives them its indorsement. This leaves the path clear for the painter, or rather he who decides upon the colors to be used. If he is a good judge of colors, and possesses a clear perception as to shades and tones, he is qualified so far as the fact of such colors, shades and tones, but he must possess other qualifications, equally important. In the first place, he must have a knowledge of the characteristics of each vehicle, so that the colors selected may be such that will correspond with the uses to which the vehicle is to be put, and the locality where it is to be used. This is a very important matter, and one that in the end determines the value of each color as an adornment. How real this is can be readily understood by taking two extremes. The park break, with its party of riders in bright and varied colored costumes, cannot be painted in sombre colors without detracting from the beauty of the outfit. A bright colored gear, a dark body, with dashes of color on minor parts, or a light colored body with bright and strongly contrasting colors on the minor parts, on the contrary, harmonize with the gay trappings and make of the whole an harmonious and beautiful outfit.

As an opposite take the double suspension victoria, in which quiet grace and dignified elegance are the essential features. One would hardly think of painting such a body in bright colors, and how grotesque it would appear if so painted; how much so was illustrated in part a few years ago by the S pillars being paneled in yellow or red. Deep, rich colors of dark shades lend richness and



MEAT AND PROVISION WAGON.—Main panel, carmine; belt, sulphur yellow; lower panel, maroon. Lettering on upper panel gold, with three shades of green, with glaze. Lettering on belt panel gold, shading black and Dutch pink. Lettering on lower panel gold, shaded black.

bespeak good taste. The same comparisons can be made in scores of cases, and they serve to intensify the importance of careful selections of colors, not only to harmonize tones and shades on individual vehicles, but in classes as well.

The great class of what are designated under the general head of buggies, in all of their sub-divisions, demand much better treatment than they receive. In the product of some factories the aim appears to be to distribute color without the slightest idea of fitness, and to stripe and ornament indiscriminately, even to the extent of ignoring the possibility of a lack of harmony between the carriage part and the body; in fact, one is led to believe that the body painters pay no regard to the gears; they simply paint the bodies to suit their fancies, while the gear painters follow the same cause, and when they get to the hanging off room "first come first served" is the motto, a green gear striped white goes with a black body striped red, and the salesman is expected to quiet the buyer by "That is the latest New York, London and Paris fashion." There is no justification for such a course, nor would a qualified and careful foreman allow it under any circumstances, even on the cheapest carriages made.

Buggy bodies, having flat panels, no matter what the outline, look best in black, dark green, dark blue or brown, the black striped with carmine, yellow or white. We will say just here that when color is mentioned, as in case of "yellow," etc., we cannot attempt to specify a particular shade or tone; the fallacy of such an attempt is shown by the fact that there are color makers who catalogue as many as twenty distinctly defined yellows. Gears may be painted in bright

or dark colors. When light colors are used the ironwork should be black; in all cases the color used for striping the gear should be one of those on the body; that is, if the gear is dark, the lightest color (the striping), should be used on the gear; if the gear is light, then stripe with the panel color. This season's colors for buggies run mainly to the black and dark green for bodies; in fact, no first class builder uses any other. The striping harmonizes with the gear. For gears there are several shades of red, pale vermilion, golden, chamois, or primrose yellow. For runabouts and others of that class, black is used almost exclusively for bodies in the East, while dark greens and browns are favored in the Middle South and West; red and light colors are used for gears, the reds being medium or dark coach, dark carmine or lake; citron, primrose, chrome, or ochre for yellows, the main point being the use of deep shades of bright colors, as these best harmonize with the somewhat heavy appearance of the job. Of the heavier top buggies, such as Cornings, physicians', etc., dark bodies and gears, striped red or some light color, are popular.

Leaving this line of work, where the panels are all flat and plain, we reach another line, such as stanhopes and other patterns of phaetons. Different treatment is here in order. These have sunken panels and framework. The painting therefore admits of change from a single color on the body to two colors, the sunken panel being in one, and the framework in another. This plan is deviated from only when solid black is used. The range of colors is increased; greens, medium and dark, dark blues, rich shades of brown, lakes, maroons and others that shade on the red, are employed for panels, while the framework and moldings are black; if striping is used it consists of a hair line outlining the moldings. This great variety of panel colors admits of a like variety for gears. As a rule, the gears are painted the same color as the panels, but in lighter shade. Thus a bronze green panel and a coach green, medium or dark, harmonize, the hair line on the panel being light green, while the striping on the gear may be black or dark green, this general plan of combinations being carried to all colors used. The painter, therefore, has an almost unlimited field for working. The one thing to be avoided, however, is the use of colors on this class of work of a gaudy character. The general principles here embodied apply to all carriages where the bodies have curved and sunken panels, while surreys and others that have flat board panels follow the lines mentioned in connection with runabouts. In the panel class we include broughams, rockaways, cabriolets, coaches, etc.

Those mentioned are standard classes, and while they constitute the great bulk of carriages built they are by no means all that test the skill of the painter. In fact they are the least of his troubles. The great line now classified under the head of novelties has opened a new field, one that admits of an almost unlimited exercise of taste in colors and combinations, but at the same time requires careful treatment to avoid gaudy effects and inharmonious combinations. A skillful color artist can run the entire gamut of colors and secure happy results, while a man less skilled would spoil everything, even when attempting to imitate the examples of his more artistic leader. Some of the greens are extremely delicate in tone, and cannot be made to harmonize with other greens. The willow green is one; this is a yellow green, while the dark milori green takes on a blue tint, making it impossible to use the two together with satisfactory results, while each have harmonizing shades. Then there is the primrose yellow. This has the faintest possible tint of green, while the Naples yellow, with its faint tint of red, makes the employment of the two in juxtaposition undesirable. Then there is London smoke, a yellowish tinted brown, and the bronze brown, with its bluish tint, that cannot be used on one job. There are also reds in great variety, as well as blues, that do not harmonize.

White is being used for striping to a greater extent than heretofore; to get the best results it is necessary to tint the white to be used with the color over which it is to be laid. If the tint is right the white will stand out pure and clear; this is by no means a new discovery, but the appearance of very much of the white striping proves that little attention is paid to the matter of preparing the white for use.

It is difficult to determine just what are the most popular colors for the novelty class, as the variety is so great. The break, light and heavy, is the largest vehicle of this class. The predominating colors are black, red and yellow. The distribution is black panels, red or yellow rockers, seat risers, imitation blinds, and brackets. The gear, the color used on the minor parts, striping, if any, on the woodwork, black; all ironwork black. These colors are frequently

deviated from, as we occasionally see a body straw color, with minor parts red, gear red, ironwork black. The two-wheeler of the Tilbury class has black, dark green, or blue body, red or yellowish gear, trimming on bodies same color as gear, striping on gear black. The high driving class of two-wheelers runs more toward light colored bodies and red gears, but there does not appear to be any general rule as to the color used.

The increased use of cane or willow work calls for a different treatment than that given to other vehicles. In the main the cane work is painted cream color, which approximates closely to the natural color; next to this is a deep green. A very neat little morning phaeton has been brought out, the seat of which is very deep and curves over sharply all around the top. The framework consists of a rear rocker eight inches deep under the seat, and a



PROSPECT MARKET WAGON.—Main panel, cream color; belt, carmine; lower, maroon. Lettering on main panel gold, shaded with Indian red split with carmine. Belt panel, letters gold, with three shades of green and glaze. On lower panel gold, with fine line of white and yellow. Striping gold, with fine line of black and yellow. Scrolls gold, shaded

drop of sufficient depth to give foot room. The rear portion of the rocker is finished with a long, oval panel, secured against the flat rocker; the drop front is finished with a scroll duster. The gear is a plain perch elliptic. The canework is painted dark green, the gear willow green, striped dark green. The few mountings are brass. This treatment gives a pleasing and appropriate appearance to this style of vehicle.

How great the variety of colors and tones to be had are can be inferred from the fact that leading paint houses carry nearly a hundred and fifty different ones, while every manufacturer has specialties not to be found in the stock of competitors. These are augmented by painters who mix their own colors. As we have said before, it is impossible to give any description of tones that will convey to the mind of the reader their true character, but we have aimed to give an idea of the colors that will prevail during the summer season, and to define as nearly as possible the peculiarities of each and their combinations.

INTERVIEWS WITH THE FOREMAN PAINTER.

THE foreman painter had got the plans for the day perfected, and all matters were running smoothly, as they usually do at this establishment, when THE HUB man entered and engaged the head of affairs in conversation. In reply to a suggestion of THE HUB man the foreman painter remarked: "Yes, for the number of men employed we get out a large amount of work, but it is not because we have quicker or smarter painters than are to be found elsewhere, nor because we work them harder. Ours is a day-work shop, but by treating the men as mechanics are entitled to be treated, paying them a wage rate that is just and reasonable, and weeding out the incompetent, the careless, and the unambitious painters, we find that we are able to organize a force of mechanics skilled in their line, contented with their lot in life, and ever anxious to do their best for the success of the business.

"But this is not the only secret of getting out so much work of a uniformly good quality," continued the foreman painter, tapping his order book reflectively. "As you will note, we are pretty well stocked with labor saving devices—apparatus that actually and to a marked degree facilitates the work in hand. In the varnish room for carriage bodies we have, as you see, three good, substantial revolving trestles. Then we have a small moving truck, similar in build to

those used by millers and flour supply houses. For especially heavy bodies, and for many other purposes, this truck is valuable. It often saves calling a painter or two from work that cannot conveniently, for the time, be left."

Here THE HUB writer interposed with the observation that the finishing appeared to be of an uncommonly high order, as shown by numerous mirror-like surfaces stored in the "set room," adjoining the finishing room. "Well," replied the foreman painter, "here again the matter of equipment plays an important part. It is not so much a measure of superior skill, contrasting one shop with another, as it is a measure of superior equipment. I have always advocated that perfect finishing can only be achieved in the practically perfect varnish room. Of course, foremen cannot always have what their best judgment dictates, but it is, nevertheless, within the sphere of every foreman's activity to argue and work for the best varnish-rooms and the best equipment. In the first place, we aim to have our varnish room dust tight, or as near that as can be. By the addition of weather strips, and the best carpentering, we get the two doors and the windows about air tight. Each door is fitted with a lock on the inside, as is also the door leading to the set room. When work is going on in the room no one is allowed to enter, not even myself or the proprietor of the establishment. This is an iron-clad rule, sanctioned at the office, and no transgression is ever attempted. Then our varnish room is located on the northeast exposure. We get morning sunlight from two east windows and light from the north, which is always the best and easiest light to work by. Plenty of north light is free from the glare of light coming from other directions at various times of the day, hence it is more to be depended upon. We use at least part of the French system of ventilation. The air comes direct from a four-inch pipe leading straight to the roof of the shop and capped by the latest improved revolving ventilator. There are many different styles of ventilators—a number in every town, fairly. The lower extremity of this pipe is considerably expanded, of a knob-shape, and is punctured, sieve-like, with many coarse perforations. The lower section can be removed and replaced at will, and in this section is constantly kept a large tuft of cushion hair obtained from the trimming shop. This is rather loosely pulled apart and enough of it used to completely fill the pipe, thus preventing the entrance of dust or dirt, while at the same time furnishing plenty of ventilation. The pipe, please notice, extends only a short space into the room. If allowed to reach too far in it would fail to catch and carry off the foul air and poisonous fumes which arise and lurk near the ceiling until the apartment becomes surcharged with the fetid gases.

"In the set room are numerous low jacks or horses for holding bodies. This room is kept dark until the work freshly varnished has set free from dust. It is an idea entertained by the best finishers, and it certainly has proven a practical one, too, that a surface kept in a dark room until the varnish has set out of the way of dust, takes a sharper, deeper brilliancy than it would otherwise. The set room is a convenience in another way, and a labor-saving one. It enables the varnisher to get the work completely out of the way at one shift. It gives him greater room and more freedom for his active working operations. Tell your readers, for me, that in the paint shop of any considerable size the set room will prove a labor saving convenience of the best value.

"And now," said the F. P., directing the writer to an apartment leading directly off from the finishing room, "here we have the asphalt rubbing deck, where all the body surfaces are rubbed on the varnish. This deck is used solely for this single purpose. As you observe, there is only a slight incline to the platform or beds, raised to the height of a single step above the shop floor. This incline leads to a waste pipe which carries off all surplus water. The small shop possibly may not have need for more than one of these decks. But no shop, however small, can afford to do without at least one. The cost is nominal. It reduces the danger from moisture to a very small item, enables the workman to proceed at a more rapid gait, and saves a good deal of time usually spent in looking after various tools that somehow get mislaid when the work is done wherever the painter happens to catch it. Here at one side of this deck is a bench fitted with drawers underneath, in which are kept sponges, chamois skins, pulverized pumice stone, rubbing pads and such other articles as immediately relate to this branch of work.

"On the rubbing deck for roughstuff we keep barrels at the rate of a barrel for each workman. A piece of hose leading from the water pipe to the barrels furnishes an unlimited water supply right to the rubber's hand. This one item facilitates the rubbing process to an extent not easily computed by the inexperienced. A bench is

allowed to run the whole length of the deck. Here is a vise in which to hold pumice stone or rubbing brick for sawing into the various sizes needed. Cast away saw blades obtained at carpenter shops and machine shops serve as good cutting utensils for the rubbing stock. Every rubber has a locker in which to keep his rubbing tools, hence there can be no disputes over the ownership of certain tools. In this way the roughstuff rubbing is reduced to the speediest possible operation.

"In the gear finishing room we have a number of revolving gear trestles and wheel jacks; horses with forked prongs to catch the axle arms of gears are used for finishing. The revolving trestles are needed in stripping and in applying rubbing coats. For wheel finishing at least four jacks are necessary per man. Thus, by the time the fourth wheel is finished the first one done, having received the needed turning, is fit to be set permanently away.

"The forked prong gear horse, revolving wheel jack, etc., with such other minor details as from time to time suggest themselves, are carried out through the other departments. Wherever we can see a chance to introduce any labor saving device we take advantage of it, and we find that it invariably pays a big profit on the investment.

"For each room a galvanized pail is furnished, into which all litter, sandpaper and refuse generally is thrown. This system conduces to cleanliness and minimizes the risk of fire. And a clean shop is a powerful aid toward winning the confidence and commanding the respect of possible customers."

At this juncture the visitor called attention to a posted notice reading in this wise:

GREASY RAGS MUST BE BURNED UP, OR REMOVED FROM THE SHOP, IMMEDIATELY THEIR USE IS FINISHED. ANY VIOLATION OF THIS ORDER WILL RESULT IN DISMISSAL.

A companion notice was worded:

SMOKING IS STRICTLY PROHIBITED ON THE PREMISES, BY ORDER OF THE INSURANCE COMPANIES.

And a third notice, conspicuously hung, contained these peremptory injunctions:

INTOXICATING BEVERAGES WILL NOT BE ALLOWED IN THE SHOP. ANY EMPLOYEE FOUND UNDER THE INFLUENCE OF LIQUOR WILL BE IMMEDIATELY DISCHARGED, AND NEVER EMPLOYED AGAIN.

"These notices," apologetically explained the foreman painter, "are not needed for the correction or reproof of those who have been long with us, but for the new help that from time to time must be added they serve as reminders of required obedience to three very vital and indispensable rules of conduct. They save much verbal admonition, and are sufficiently emphatic to restrain the reader from trifling with their terms."

The room in which the repair work is unhung and hung-off after finishing was next visited. "This, at certain seasons of the year," said the F. P., "is a very busy room, and here, as elsewhere in the shop, we try to furnish the needed conveniences to quicken the work. Here in this small apartment is a rack for cushions, storm aprons, dashes, carpets and other extras belonging to the average carriage. A second two-tier rack holds tops of the various styles. In this apartment, too, we store toe rails, steps, body loops and such other metal furnishings which it may be necessary to remove from the work. It is highly desirable that all such equipment be kept together if possible, and, more important still, that it be kept in clean quarters.

"For unhangings and hanging off work, two or three good hammers are needed, also a pair of bolt clippers, a dozen malleable iron S wrenches of various sizes, some regulation axle nut wrenches, running from 3/4-inch to 1 1/2-inch, shaft couplers, brace and bits of several sizes, punches, axle grease, anti-rattlers, axle washers and so on. Nothing so tends to simplify and surely expedite this class of work as a first-class outfit of good tools."

At this interesting stage of conversation the foreman painter was called to another part of the shop, and THE HUB representative hurried to catch a down town car, refreshed and cheered by what he had just been permitted to see and hear.

WHEN a man is first married he imagines the earth a Garden of Eden and fondly dreams there is but one man and one woman in the world. Alas! It is not long before he runs up against the same old snake and shudderingly discovers his own innate fondness for apples!

Trimming Department.

TRIMMING FOR A SASH-DOOR DEPOT WAGON.

Continued from page 19, April Hub.

THE style of the back cushion and the seat fall is shown by Fig. 4. Make the front cushion facing on a stiff backing, $2\frac{1}{2}$ in. wide. Sand-paper off the face side of the backing and draw two lines through the center $\frac{3}{8}$ in. apart. Paste the facing on to a backing of thin muslin canvas, trimmed off $\frac{3}{8}$ in. full around the facing. Paste a strip of wadding on each space along the center line and the out edge of the facing.

Paste down the cloth on the $\frac{3}{8}$ in. space at the center of the facing and along the edge of the margin on the backing. When the paste is

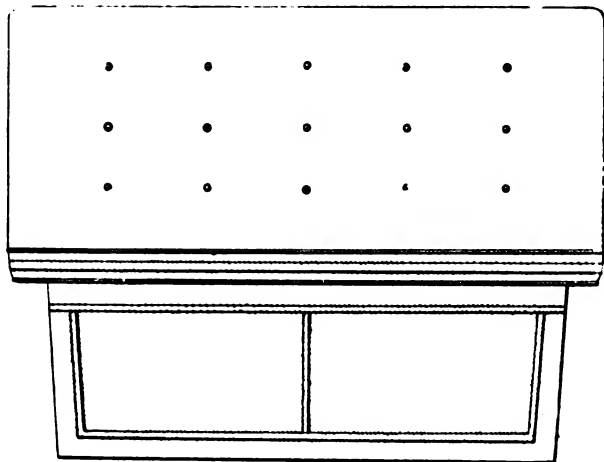


FIG. 4. BACK CUSHION AND FALL.

dry, the two center lines are marked with soft chalk and nicely stitched on the machine. Lay off the cushion top with $\frac{1}{4}$ in. fullness between the tufts each way, and $\frac{5}{8}$ in. around the edges; gather the fullness in regular between the tufts, and plait out the rest of the fullness at the corners. Make the backing for the seat fall with one piece of buckram and a piece of thin canvas, well pasted together. Shape the backing to fit in between the rockers and to tack along the seat front. Lay off the backing for the fall for two lines of stitching, $\frac{3}{8}$ in. apart. Cover the backing with a layer of thick wadding, with the glazed part next to the cloth taken off. It is best to take a few basting stitches with soft thread through the wadding in the two large spaces; cut the wadding neatly away from the stitching lines. Paste the cloth first down along the top stitching lines, and then along the center lines, then the end lines, and lastly the bottom lines; in pasting on the cloth care must be used

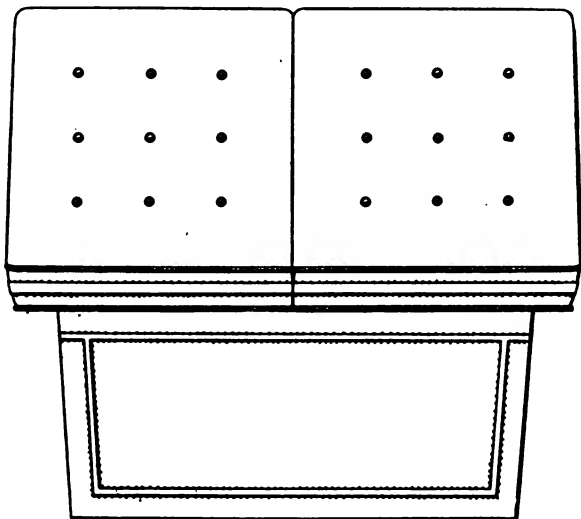


FIG. 5. FRONT CUSHIONS AND FALL.

to prevent wrinkles or strained places. The cloth, when the fall is finished, ought to look smooth, without being strained. When the paste along the stitching lines is dry, trim the wadding $\frac{3}{8}$ in. away

from the side and bottom edges (not the top edge); paste the cloth down on the edges and over on the backing. After the fall has been neatly stitched, slip a thin iron in between the canvas and the buckram at the bottom of the fall. Tack the backing of the fall to the

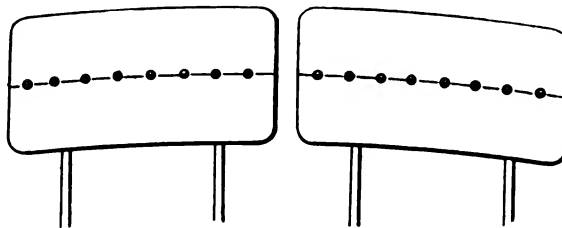


FIG. 6. TWO REST BACKS FOR FRONT SEAT.

edge of the seat board and turn the cloth over and tack to the top of the seat, and finish with seaming and pasting laces.

The style of the front cushion and seat fall is shown by Fig. 5, which are to be made up precisely like the back seat cushion and fall, except that the front seat has two short cushions. Fig. 6 illustrates the two rest backs on the front seat. Make the pads with muslin first, with $1\frac{1}{2}$ in. fullness in the rolls; work the rolls up firm, without lumps in the hair. Cut off the eyes of the tufts and nail the tufts to the wood. Fasten the edges of the backs with seaming and pasting lace, seaming first and pasting next.

Finish the job with inside drop curtain and a good storm apron for the front. Make the facing for the door holders with two lines of center stitching, to correspond with the other made lace. Finish the inner edge of the front seat with a band made to correspond with the cushion facing, without seaming lace at the bottom; finish the top edge of the band on top of the seat board with seaming and pasting laces.

STANDARD TRIMMINGS.

A FEW of our leading builders are showing a disposition to establish some standard for trimming special lines of vehicles. Beginning with the one man wagon they make a medium thickness cushion with a flat, plain top, cloth front, cloth welts or cords, perfectly plain fall and back; no trimmings on the inside of the seat panels; dash with straight handle holes cut into the leather; three bow top, medium spread; straight top props, bows and rails, leather covered, everything plain and neat, the material being cloth, maroon, green or black. The maroon is the newest idea, as this color harmonizes well with the dark colors of paint used.

In the runabout class, that is, the real square box, long body vehicle, the seat being for two persons, two short cushions are used instead of one long one. These are tufted "biscuit"; fronts cloth, cord cloth covered; lazy back tufted same as inside of seat, panels lined smooth; fall, plain center, with welted ends and bottom; dash hand holes, triangular; seat rail leather covered, with fine grain morocco. Material, whipcord, gray mixed, or one of the drab cloths; no top.

Top buggy, square box. Single or double cushion, diamond or biscuit squabbed, back same as cushion; inside of seat panels, thin squabbed or plain; fall, double welt; hand holes in dash, straight or triangular; three bow top, roll up curtain, covered bows; a spread of liberal dimensions; head lining and other top lining, cloth, with a plain cloth facing; top props, straight; rails leather covered, with patent railing leather; material, cloth, green, blue, maroon or dark drab.

Cornings, or other cut down or low fronts, such as the Goddard and two passenger phaetons, full squabbed, same as other two passenger buggies, but fuller backs; cushions, lace or cloth fronts; lace covered cords, and finishing lace elsewhere. When made with roll-up curtains the three bow top is used, and the bows are covered. When close top, three or four bows, with side lights. The facings of coach lace and all cording are lace covered. The close tops are lined throughout, but perfectly plain except the lace. Dashes finished with straight or triangular hand holes. Materials cloth, blue, green, maroon or drab. Of the latter there are several shades, notably those that have a slight bluish tint, and others a faint tint of green. These tints are very delicate, but they serve to give a harmonious effect when used with the proper colors of painting. The close tops are extra large, giving a good storm protection.

Traps and other four passenger carriages without tops are almost exclusively trimmed with whipcords or Bedfords. These withstand

the elements better than cloth, and are in so many colors that are either neutral shades or so much so that they can be used with almost any of the popular shades of color. Some houses prefer them squabbed, others perfectly plain, but each house follows out one scheme.

Stanhopes, dukes and spiders are in a measure a class by themselves. The tops are the full, close phaeton three bow, of ample proportions, top joints slightly curved, finished black except the caps of the prop nuts and joint rivet heads; these are plated. The squabbing is heavy, and follows brougham patterns. Cushions in many cases are without the regular front, the top being carried over to the bottom edge in plaits. In other cases coach lace is used for the fronts, and the usual narrow laces elsewhere. Material is very largely drab cloth for dukes and stanhopes, and dark cloth for spiders, although each style is to be found trimmed with cloths of the different colors. The surrey, the popular four passenger carriage, when made up with a phaeton top, is almost universally trimmed with dark cloth and laces. When open, or with canopy top, whipcords and Bedfords are used more than cloths, as the former are best adapted to resist the influences of sun and water.

In speaking of these materials and colors we have confined ourselves to high grade work, but there is nothing to prevent the manufacturers of medium or low grades following the same general line of procedure, as cloths of almost every color are furnished in light weights, 5 oz., and all the intervening weights up to the heaviest. Of course qualities are also equally as extensively graded, so that effects can be produced, even though quality is not a feature.

Another year may find manufacturers following a different course in selections of colors and in patterns of trimmings, but the schemes here outlined will govern during the present. The question is often asked, Which leads, cloths or fancy stock, such as whipcords, etc? Cloth dealers place it as about 4 to 1 in favor of cloth. The use of laces has fallen off to a considerable extent, but this is the most pronounced in the East and in the extra high grade carriages.

CARRIAGE MAKERS DINE.

THE monthly dinner and annual installation of officers of the Carriage Makers' Club, of Cincinnati, O., took place April 12 at the Grand Hotel. The meeting was attended by a large number of the representative manufacturers in the city. The addresses made were on topics directly interesting to the trade, and suggestions were made for the betterment of trade conditions. Reports of officers were of an encouraging nature, both as to the condition of the club and the carriage business. The installation of the officers preceded the dinner. The new officers are: President, H. M. Pollock; first vice-president, John McGrath; second vice-president, Louis G. Mayer; treasurer, W. H. McCurdy, and secretary, S. D. Baldwin.

The following standing committees were appointed:

Labor—W. A. Sayers, chairman; H. Ratterman, William Hawes, H. H. Nelson, M. Doucette.

Entertainment—E. V. Overman, chairman; L. K. Emerson, Lon Buob, W. H. Bowe, J. W. Herron, Jr.

Insurance—H. J. Robben, chairman; A. Lounsberry, George W. Brown, W. W. Warner, George L. Hamilton.

Legislation—Theodore Luth, chairman; George Monteith, O. E. Walker, Joseph Nithaus, J. F. Taylor.

Press—S. D. Baldwin, chairman; W. T. Harvey, C. C. Wick, Theodore Scheu, W. J. Haldeman.

Freight and Classification—A. G. Brunzman, chairman; G. H. De Golyer, W. H. McCurdy, Morris Woodhull, P. P. Hunter.

New members elected are:

William A. Haven, E. H. Busch, Joseph Snow, Jacob Haberer, Jr., H. Liebman, W. W. Sechler, L. G. Mayer, J. H. Brennan, Theodore Luth, A. G. Brunzman, Willard Elmendorf, W. T. Harvey, W. A. Sayers, M. J. Crotty, Henry Higgin, F. H. Rose, William Hawes, E. J. Hess, C. L. Stephens, W. H. Bowe, M. Doucette, H. E. Morrill, C. C. Wick, Monte L. Green, W. G. Brown, J. F. Taylor, A. Morsbach, Joseph Shelt, H. M. Pollock, John McGrath, S. D. Baldwin, O. A. Timberlake, William A. Haven, Theodore Scheu, Lon Buob, L. A. Hooker, George Brown, O. E. Walker, George S. Brown, Lee Mitchell, Henry Zwick, R. T. Walbank, William Laidlaw, Ed. Bowman, E. S. Bogle, Charles Behlen, J. M. Eilers, Thomas Buchanan, George Huntman, W. Van Dusen, John P. Pollock, O. A. Armleder.

A MULE is a bad pun on a horse.

THE CARRIAGE TRADE OF JAMAICA.

THE oft-repeated adage that charity begins at home needs but little transposing to render it applicable to a large part of our export trade. It is not so much the markets of distant parts of the world that should be studied by manufacturers in the United States, but those nearest to our shores, where manufacturers can gain initial experience with the least possible outlay. The neighboring markets once secured, it is a comparatively easy matter to extend the bounds of our export trade to more distant climes.

These conditions are peculiarly applicable to the carriage trade. There are many countries more easily accessible to Americans than to any other nation, which require only a slight stirring-up to make them as good customers as the average carriage-maker could wish to find, but which are nevertheless imperfectly cared for.

Chief among this category is the island of Jamaica, located just off our coast, and connected with our ports by regular steamship communication. Few countries can boast a better system of highways than little Jamaica, while there is practically no home industry for supplying the domestic demand for vehicles. In addition, the government and municipal reports show a steady growth in the popularity of the island as a health and winter resort. Hundreds of cyclists are attracted thither annually by the good roads and wonderful climate, and under the excellent system of government thrift and prosperity are noticeable on all sides.

The custom statistics of the port of Kingston, the capital and seat of government, testify to a steadily increasing trade in imported carriages, especially pleasure vehicles. As far back as 1897 the importation of pleasure conveyances amounted to a value of \$38,565. Since then the figures have gained, reaching last year a total of slightly more than \$50,000. Of this the United States secured by far the greater part, Canada and England being the sole competitors in the market. Similar improvement was experienced by the trade in carts and wagons, which increased from \$11,000 in 1897 to over \$19,000 in 1899. The proportion here is also in favor of the United States, England having secured only about one-fourth of the business.

As an indication of the thorough healthiness of the growth, it may be added that for a number of years the imports for each year have been in excess of those of the preceding twelve months. Although these conditions apply to the trade in all kinds of vehicles they are especially true in the case of high-grade carriages, the use of which becomes more widespread as the prosperity of the island advances. It would seem, however, from the reports that occasionally reach this country from Kingston, that if the methods employed by the American carriage-makers in pushing the sale of their goods in this country were employed to a greater extent in their trade with Jamaica, they would experience little difficulty in cutting off the imports from Canada and England entirely, thus securing for themselves the whole of the trade. The conditions are so wholly in favor of the American carriage, wagon or cart that the market is practically as much the property of the Americans as Cuba will henceforth become, and it ought accordingly to be worked as such.

There are a number of importers and dealers in the island who draw the bulk of their supplies from the United States. These dealers order according to their customers' wants, and their chief aim is to get the desired article at a figure which will leave them the largest margin of profit. The American maker fills the order and waits for further business. As a rule, he takes little active interest in the market, and scarcely, if ever, gives a thought to the probable amount of business his competitors are doing with the island. Consequently his trade runs along in a hum-drum manner, always increasing, to be sure, but not to the extent it might increase were he to send a representative there once in a while to study prevailing tastes and learn what might be done in effecting improvements in popular styles. With a fair amount of personal attention on the part of the manufacturers themselves a comparatively isolated market like Jamaica very often develops unexpected qualities as a buyer, and amply repays the exporter for his expense and trouble in making a study of the situation.

Owing to the fair climate and the excellence of the roads, the chief demand for pleasure vehicles in Jamaica centers upon light open carriages, dog-carts, buckboards and similar vehicles.

In the matter of customs duty, the hindrances to trade are very slight. All carriages, wagons, carts, etc., with or without springs, and "not being such as are ordinarily used as vehicles of pleasure," are exempt, while all others pay a duty of 12 per cent. *ad valorem*. The sole stipulation in regard to shipments is that cases be marked with the country of origin, as, for instance, "Made in the United States."

REPORT OF FREIGHT AND CLASSIFICATION COMMITTEE.

ON December 19 the freight and classification committee of the Cincinnati Carriage Makers' Club called a meeting of carriage manufacturers at the Grand Hotel, Cincinnati, O., and discussed the subject as to taking action regarding a proposed change in classification on vehicles.

The proposed change in the official territory, taking effect January 1, 1900, was the raising of carload vehicles from fourth class, 20,000 lbs. minimum, to third class, 16,000 lbs. minimum, regardless of length of car, from first class on packages crated 30 inches to 1½ first class, and from 1½ first class on packages crated 50 inches to two times first class.

Prior to the meeting December 19, the Carriage Makers' Club of Cincinnati engaged at their expense the services of E. P. Wilson, chairman of the Freight and Classification Bureau, Cincinnati, to represent them in the proposed idea of bringing the Official Classification Committee before the Inter-State Commission at Washington. The result of the effort in this direction is generally known, and the sense of the meeting December 19 was to engage the Hon. J. H. Bromwell, Congressman from this district of Ohio, to legally represent them, and to appoint a committee of ten carriage manufacturers to appear before the Commission in conjunction with the Hon. J. H. Bromwell and E. P. Wilson, the following gentlemen being appointed:

Morris Woodhull, of Morris Woodhull, Dayton, O.; W. H. McCurdy, Brighton Buggy Co., Cincinnati, O.; G. H. DeGolyer, Sechler & Co., Cincinnati, O.; Lowe Emerson, Emerson Carriage Co., Cincinnati, O.; C. D. Firestone, Columbus Buggy Co., Columbus, O.; T. V. Thompson, Manley & Thompson, St. Louis, Mo.; D. M. Parry, Parry Manufacturing Co., Indianapolis, Ind.; H. K. James, James & Mayer Buggy Co., Lawrenceburg, Ind.; W. A. Paterson, W. A. Paterson Co., Flint, Mich.; A. G. Brunsman, Anchor Buggy Co., Cincinnati, O.

The result of this effort has been generally published. This, in connection with efforts made individually and collectively, led to a hearing of shippers before the Traffic Managers at New York City, January 22, 1900. The gentlemen appearing before this Commission, and who were received with courtesy and every opportunity to present their grievances, were A. G. Brunsman, Lowe Emerson and Morris Woodhull.

In the western territory carload provisions were made requiring 50 per cent. freight vehicles in order to retain Class A rate 20,000 lbs. minimum, which virtually eliminated the possibility of carriage manufacturers using Class A rate.

Changes were made in carload third class rate, making the minimum 16,000 lbs. instead of 12,000 lbs., as heretofore, and entirely eliminating vehicles with tops stretched, or partly stretched, this ruling virtually making it necessary to either crate goods low, or to ship either with tops separate, or pay less than carload rate on that portion of the vehicle. There was no disturbance in the less than carload business in the Western Classification territory.

The committee in the meantime personally took up the matter of extended or partly extended tops with the chairman of the Western Classification Committee and promptly received the assurance that that matter would be adjusted, which it was, and in this way the carriage trade, so far as that feature was concerned, were in no way inconvenienced or interrupted.

The Western Classification Committee set a meeting of Traffic Managers February 6, 7, 8 and 9 at Great Northern Building, Chicago, to take up the grievances of shippers. A. G. Brunsman and W. H. McCurdy were appointed to attend that meeting. The committee were here also accorded every courtesy and privilege to express their grievances and given an opportunity of stating their desires. The following is submitted you as a final report of changes made and the result of their efforts:

OFFICIAL CLASSIFICATION.

Restoration of fourth class—20,000 lbs. minimum.

Reduction on 30 inch packages from one and one-half first-class to one and one-fourth first class.

No change in 50 inch packages.

The above taking effect March 10, and as per Official Ruling Circular No. 129.

WESTERN CLASSIFICATION.

Elimination of any ruling against top stretched work.

Restoration of Class A rate on 20,000 lbs. minimum, without any specified quantity of freight vehicles, but with a penalty of 2 per cent. per foot for each foot in excess of 40 foot length car (the western roads, with possibly some exceptions, agree by special ruling to disregard the penalty and use Class A rate, 20,000 lbs. minimum, regardless of length of car).

Third class—16,000 lbs. minimum, was changed to 12,000 lbs. minimum on cars not exceeding 45 feet in length, with a deduction of 5 per cent. in minimum weight for each foot or fraction thereof less than 45 feet, and a penalty of 5 per cent. per foot in minimum for each foot or fraction thereof in excess of 45 feet, rate second class.

UNFINISHED BUSINESS.

The committee are still hopeful of getting a lower rate on 50 inch crates in the official territory. Mr. Morris Woodhull and Mr. C. D. Firestone called on Mr. Gill in New York City on Saturday, March 17, filing a request as follows:

MR. C. E. GILL, Chairman, New York City.

DEAR SIR—Prior to January 1, 1900, vehicles, N. O. S., two or four wheeled, K. D., crated or boxed, shafts or poles wrapped, wheels inside or outside, if bundled or crated flat (see note)—package exceeding 30 inches in height, but not exceeding 50 inches in height and not exceeding 94 inches in length, were classified as 1½. At the same time, package not to exceed 30 inches in height and 94 inches in length, was classified first class.

The articles first named were raised to D-1 class and the last to 1½ class, as per Official Classification No. 20, but the last named were subsequently reduced to 1¼ as per Supplement No. 2, effective March 10, but no reduction was made on the 50 inch package. We therefore ask you to consider a reduction of the 50 inch package, making same 1¼ instead of D-1 as now in force, and instead of 1½, as in force prior to January 1. We ask that this be done at the earliest possible date, as the carriage season is now on.

This request we ask you to copy and file with the different railroad companies, so as to emphasize our demands.

Respectfully submitted,

A. G. BRUNSMAN, Chairman.

FIRST ANNUAL SPEEDWAY PARADE.

THE great impetus given to road driving by the building of the New York Speedway has resulted in bringing to the city a large number of horses that have fast records, and made a great increase in the demand for light speeding rigs. As these are the property of gentlemen who engage in speeding for health and pleasure every objectionable element is eliminated that could interfere with this healthy and manly sport. To further increase the interest, the Road Drivers' Association has been formed, and on May 5 the Speedway was the central point of attraction of horse lovers, to participate in or to view the first annual parade.

The parade started from Seventy-second street and Riverside Drive at 2:30 sharp, in the following order: The president and officers of the association, cup winner of 1899, executive committee, race committee, guests of the association and world-famous horses.

First Division: Single horses to one-man speed wagons.

Second Division: Single horses to wagons holding two persons.

Third Division: Teams to one-man speed wagons.

Fourth Division: Teams to wagons seating two persons.

Fifth Division: Miscellaneous, surreys and all light traps allowed on the Speedway.

Police escort. The reviewing stand was located at Durando's Speedway Club House.

The objects of the association are as follows:

Improvement in both breeding and speed of all horses.

The proper preservation of Speedway Park and its adornment.

Legislation for good roads and good rules of the road throughout the State.

The fostering of a friendly spirit among horse owners and horse lovers, and

The arrangement of friendly amateur brushes between the horses owned by members (to wagons only), for cup or trophies and never for money. And also the preservation of an inter-city cup, to be competed for by the best and fastest horses from other cities, who will endeavor to take it away from us—if they can.

The arrangement and perpetuation of an annual parade in this city (New York) of all its best and fastest horses.

The parade was a great success. We will publish a full account of the turnouts, particularly the vehicles and harness, in June HUB.

CLOSING OF THE TECHNICAL SCHOOL TERM, 1899-1900.

THE school term for 1899 and 1900 closed with appropriate exercises on Tuesday evening, April 10. The class room was fitted up as an exhibition hall for displaying the work of the students, and it is to be regretted that more friends of the school are not so situated as to make it possible for them to visit it on the term closings and to closely examine the work of the pupils, and by comparison more clearly learn the progress made and the ability of the students. The association has every reason to be proud of the school which it has established and maintained, and the entire world of carriage builders has been benefited by it.

We know of no school wherein the practical and the theoretical are so closely intermingled. To be a pupil one must be connected directly with the carriage manufacturing industry, and good morals are additional requisites. Starting with these the pupil takes up a course of study which is at once thorough and can be grasped by men of intelligence. As a result the pupils come directly from the workshops. The most of those who attend the evening class work during the day in the shop, while the members of the day class are men who have dropped the shop temporarily in order to give closer attention to technical instruction. Then in addition there is the great corresponding class, numbering 340 pupils, living in various States and in Canada, where they are taking a preliminary training which fits them for the day or evening class, or gives them a better appreciation of the work done than they could get in the ordinary course of shop work.

The present instructor, Andrew F. Johnson, is himself a graduate of the school, and a practical bodymaker; possesses rare qualifications as an instructor, and in addition wins the respect of his pupils by his evidences of interest in their welfare. How sincere this is, is shown each year in a practical way. This year it took the form of a presentation to him by the class of a roll top office desk, and is further shown by the fact that the attendance of those entering the class has ranked as high as 98 per cent., and seldom under 90 per cent.

The exhibits this year were specially interesting, the number of full size working drawing being greater than any previous term closing. In most cases the designs are original, although in keeping with the general drift of fashion; a few were from well-known studies, and all showed real merit in execution. The following constitute the list of working drawings and the names of the pupils:

J. C. Kaiser is credited with six, a cutunder phaeton, a brougham carriage part, a coach gear, a rockaway body, a two passenger phaeton body and a four passenger surrey, all practical working drawings, clearly and neatly executed.

J. Laurence Hill: A pony phaeton body, a buggy body and a panel seat, complete in plans and well executed.

Gus Obergfell: A cabriolet body, neat in design and complete in technical details.

Thomas W. Swallow: A brougham body on present lines, clearly laid off for the workman.

George W. Rauch: A well executed drawing of an old style O G gig body, one of the standard studies.

Harry J. Mummary: A brougham body, complete in all working lines, and well executed.

Charles Hoelzer: A victoria body, of good design, complete in working plans, neatly executed.

Otto A. Gresbach: An old O G gig body which showed careful study of details; one of the regular studies.

Ernest A. Stach: A buggy body, of original design, well executed.

William Hanlon: An O G gig body, carefully drawn. An excellent reproduction from the regular study.

Louis H. Robensteen: A victoria body, of good design, well executed, and complete in details.

Two additional working drawings were shown, but the pupils had neglected to affix their names thereto, and we are therefore compelled to pass them without other notice.

In addition there were 104 drawings by day and evening pupils, covering the entire course of studies in geometrical scale, free hand, and drawing of parts of ironwork, etc. These evidenced care, and gave a good idea of the really practical work of the school. In addition there were shown thirty scale and geometrical drawings by the corresponding class, the execution of which spoke volumes in favor of this method of teaching those who cannot attend the day or evening classes. How interested this class is in its work can be inferred from the fact that 100 drawings were received by the instructor, for examination, during the month of March.

The total of the pupils during the term just closed was twenty-seven, in addition to the 340 corresponding pupils, whose term is continuous. THE HUB congratulates the C. B. N. A., the trustees and Andrew F. Johnson, the instructor, on the success of the school.

C. B. N. A. TECHNICAL SCHOOL ANNUAL BANQUET.

THE annual banquet of the Technical School for Carriage Draftsmen and Mechanics was held at the Brevoort House, New York City, on the evening of April 16, 1900, and proved an interesting and enjoyable affair. The banquet is given to the past and present members of the school, and furnishes an opportunity for a renewal of old associations. Plates were set for fifty, and every chair was occupied. The school was represented by Franklin Murphy, William Ogden and E. M. Hotchkiss, of the Board of Trustees, and Andrew F. Johnson, Instructor. The trade journals were represented by W. W. Wood and Charles A. Heergeist, of the *Carriage Monthly*; Walter D. Gregory, William N. FitzGerald and Jacob F. Klein, of THE HUB, the latter being a graduate of the school, and C. H. E. Redding, of *Harness*. The other guests were Daniel P. Wilson, H. Duhamel, carriage builders; Frank S. Grob and Mr. Lake, of the Young Men's Institute, the others of the assemblage being past or present members of the school. An inviting menu was provided, and the tables were neatly decorated with colored lights, flowers and fruits. About two hours were spent in partaking of the eatables, after which Franklin Murphy, chairman of the Board of Trustees, made a short address, congratulating the class upon the opportunities offered by the school, and for the good work done. He then called upon the following, who made short addresses: Frank S. Grob, Andrew F. Johnson, D. P. Wilson, W. W. Wood, W. D. Gregory, H. Duhamel, William W. Ogden, E. M. Hotchkiss and Mr. Lake. The exercise closed at 10:30, and all united in proclaiming it the most successful entertainment yet given to the class. The Board of Trustees deserve the highest compliments for the manner in which these banquets are conducted, and the recollections of them will be pleasing to those who were present, for years to come.

THE PHILADELPHIA HORSE SHOW ASSOCIATION.

THE ninth annual open-air Horse Show of the above association will be held at Wissahickon Heights, Philadelphia, May 28 to June 2, inclusive. The entries will close on May 12.

This is one of the most important of our horse shows, and is each year a central attraction for Philadelphia society, as well as lovers of fine pleasure carriages throughout the country. It offers to Philadelphia an opportunity to prove that the citizens of the Quaker City love the horse and possess a full share of the handsome turnouts of the country. The park where the show is held is most beautifully located, easy of access, and few more attractive sights are offered than the grand stand and ring on an afternoon of the show. Those of our readers who may wish special information can obtain it by addressing the secretary of the Philadelphia Horse Show Association, 411-412 Harrison Building, Fifteenth and Market streets, Philadelphia, Pa.

THE BALTIMORE HORSE SHOW.

THE second annual exhibition of the Baltimore Horse Show Association will be held on the grounds of the Elk Ridge Hunt Club, May 17, 18 and 19. A liberal list of prizes has been offered, and the entries give assurance of a successful exhibition. For special information address W. M. Manly, secretary and treasurer, 106 East Saratoga street, Baltimore, Md.

HIGH PRICES FOR HORSES.

IF the present high prices for horses are maintained the time is not far off when the automobile will be cheaper than the animal. The average prices realized by sales stables and auctions this spring have seldom been exceeded, while exceptionally fine animals have been in such demand that competition runs the prices higher than ever before. This was instanced lately by two notable sales in New York within a week. One was for "The Turk," at auction, which was purchased by C. F. Kimball, of Chicago, for \$7,800. The other was for "Red Cloud," bought at private sale, by T. W. Lawson, of Boston, for \$10,000, both horses being of the heavy coach type. While these represent the top prices, \$1,500 to \$2,000 have been common.

PAN-AMERICAN EXPOSITION, 1901, BUFFALO, N. Y.

THE progress made and the interest shown are such as to assure a most interesting and extensive exhibit at the Pan-American Exposition, to be held in Buffalo, N. Y., in 1901. THE HUB will keep its readers informed regarding the progress of the work of building and the entries made for exhibition. Special attention will be given to the matters most direct in our line, but general matters of interest will not be overlooked. As the Machinery and Transportation Building will be the central point of attraction for those interested in carriages and motor vehicles, we give our first illustration:

MACHINERY AND TRANSPORTATION BUILDING.

One of the biggest buildings of the Exposition will be that devoted to Machinery and Transportation. This will be 500 by 350 feet, with a central court 100 by 175 feet. Its location is on the

In January last Hon. R. H. McCarthy and Hon. G. T. Fenwick visited Ottawa as delegates from the island. They had several interviews with members of the government, declared themselves well satisfied with their reception here, and afterwards left for Washington. They carried back to Trinidad with them reports of what Canada and the United States were prepared to do. What the Canadian government finally proposed to give was practically free trade between Canada and the island, except on spirits and tobacco. The United States, however, gave on the other hand 12½ per cent. reduction, as provided for by the United States tariff, on cane sugar, asphalt, fresh fruits, except oranges, and vegetables.

In return for this Trinidad places some forty-one articles on the free list. The principal of the articles are agricultural implements, beans and peas, books, vehicles, coal, coke, charcoal, clocks, corn, bicycles, eggs, grain, hay, canned fish, fruits and vegetables of all kinds, lamps, all kinds of machinery, boilers, meats, mules, poultry



PAN-AMERICAN EXPOSITION—MACHINERY AND TRANSPORTATION BUILDING.

west side of the main group, opposite the Court of the Fountains. It is built in the type—as all the other principal buildings are—of the Spanish Renaissance, modified to suit the conditions of the Exposition. The work is far more ornate, however, with roofs laid with red tile and the cemented walls brilliant with color. The colors are to be of reds and yellows in light tints. The façades will present an arcaded effect, with broad overhanging eaves, in imitation of the old mission buildings found in California and Mexico. Each façade will be broken by an important architectural feature, and each corner flanked with low pavilions, the design giving large plain surfaces for color, while the eaves give deep shadows. The loggias, balconies, pavilions and other places are to be ornamented with shrubs, vines and flowers, blending with the coloring of the building. The openings are grided with specimens of wrought-iron "Rejas" or grill screens, such as are seen in examples of Spanish architecture of the sixteenth century.

The building has numerous entrances, the principal ones being in the center of the four façades. Once inside the structure, the size will be appreciated. All the towers, pavilions and other proper spaces are to be brilliantly illuminated and made gay with banners and flags.

The Central Court will be a veritable tropical garden, with a long, narrow pool containing interesting specimens of aquatic life, and will have winding paths and seats among the flowers and shrubbery, where the weary visitor may find rest and diversion from his study of the more practical features of the Exposition.

FAVORS UNITED STATES.

OTTAWA, April 16, 1900.

OFFICIAL despatches received from Trinidad no longer leave any doubt on the report that the negotiations for reciprocal trade between Canada and Trinidad have been declared off. The reason for this is that the island has decided by a vote of the Legislature of 13 to 5 that the offer of the United States would be of greater advantage to their land than almost anything that it could be possible for Canada to give it. On that vote the convention with the United States was ratified.

and wire fencing, ten articles from the United States, such as bread and biscuit, cheese, cotton and oil, flour of wheat, lard and its compounds, oleo-margarine, butter, beer, lager; only lumber, yellow or pitch pine and cigarettes are to enjoy a minimum of tariff.

The delegates in their report to the Trinidad authorities on Canadian trade say that the 12½ per cent. reduction from the United States, with the advantages of the countervailing duties, the nearness and the unlimited extent of the American market, compared with the small market in Canada, explained why trade relations with the United States were more to be desired than with Canada. Montreal refiners told the delegates that the consignments of sugar from Trinidad to Canada could only be made on definite orders. "The position would be simplified," say the delegates, "if Canada following the example of the United States, would impose countervailing duties." The delegates repudiate the report that Canadian flour will not keep in Trinidad. There is considerable regret here over the failure of the negotiations with Canada.—*Boston Transcript*.

COLONEL CARLISLE'S ACKNOWLEDGEMENT.

SOUTH BEND, IND., April 7, 1900.

Editor of THE HUB, New York.

DEAR SIR: I have to-day received an express package containing a beautiful loving cup, with the compliments of the accessory trade in behalf of my efforts in their interests. What little I have done in behalf of the accessory trade has been cheerfully performed by me, as in my judgment I considered it for the very best interests of the Carriage Builders' National Association, and I sincerely appreciate the compliment that they pay to me in the presentation of this cup, and I beg that you will convey to all who have participated in it my sincere thanks.

With kind regards and best of good wishes, believe me,

Very truly yours,

C. A. CARLISLE.

ADVERSITY to a man is like training to a pugilist. It reduces him to his fighting weight.

CARRIAGE TIMBERS. THE MOST DESIRABLE KINDS.

(ILLUSTRATED.*)

THE American carriage and wagon builder possesses an advantage over all others in having native woods which cannot be surpassed for specific uses. Were he to search the world over, he could not find any one timber that would be superior to that which he now has at his command. We say this from our present knowledge of foreign woods; if there be any that excel ours they have not been discovered. It is possible that certain tropical woods possess qualities that fit them for use in tropical countries, but these are few, and are confined to specific localities, outside of which they rank below our woods. Our most valued timbers are hickory, oak, ash, whitewood, elm and maple; the secondaries are locust, ironwood, birch, basswood, pepperidge and gum.

Hickory stands first in importance for light wheels and for such other parts as require great strength and elasticity. There are six varieties, three of which, however, should not be counted, as they are lacking the essential qualities of this timber, although with one exception they are marketed to a greater or lesser extent. These six varieties we will name in the order of their value and importance.

HICKORY.

Pig-nut hickory: This is the best of the family, although not the largest, as the trees seldom reach a size above 18 inches in diameter. It is fine grained, very close, of a bluish white when seasoned, straight grained, very heavy and elastic. The trees flower in May. This species was formerly abundant in New Jersey, Pennsylvania and Delaware, also in that portion of Connecticut bordering on Long Island Sound, and in Southeastern New York. Sub-varieties were quite numerous in the New England States and in New York, all of which gave good timber. The great demand for this superior wood has led to its practical extinction, no attempts having been made to grow it, and it is doubtful if enough can be found throughout the entire territory where it formerly flourished to run a medium sized wheel factory one year, and yet with intelligent treatment marketable timber in large quantities could be grown in twenty-five years. That no attempt is made to grow it is due to the hide-bound theories of forestry associations and timber scientists.

Butternut hickory grows to a large size. It is very fine and close grained, elastic and seasons heavy. It is white and straight grained, but is more affected by the soil upon which it grows than most other varieties. That grown upon rich, heavy soil is almost sure to be of fine quality. That grown on light, sandy or on low grounds, while appearing, when cut, equal to that grown upon the richer soils, becomes brittle when seasoned, thereby becoming rigid and unfitted for spokes, shafts, etc. This variety flowers in May; it is most frequently found in New Jersey, Pennsylvania and New York.

Shag-bark hickory is a straight grained, white hickory. It grows to a medium size and is a quicker grower than those previously mentioned. When grown upon strong soil and cut at the proper age and season it gives a fine, elastic, durable, high grade timber. If too old or thick forest grown, it is liable to season brash and to lose its weight. It therefore requires much care in handling. It flowers in May and is found mainly in New York, Pennsylvania, Virginia, West Virginia and North Carolina. The demand for the past few years has been so great that this, too, is beginning to take its place among the disappearing varieties.

Shell-bark hickory is a free grower; the wood is mainly red, and, except under the most favorable conditions of soil, it seasons brittle and decays rapidly. It is at its best when the trees are small, but the percentage of good timber is very small. It flourishes in the Middle, Western and some of the Southern States.

Water hickory is found in all localities where the hickory flourishes, and is the most deceptive of all, as the wood is frequently white, the grains heavy and apparently closely knit, but when sea-

soned it loses its elasticity and although heavy, is of little value. It grows on low lands and on the banks of small streams.

Pecan hickory flourishes in the Gulf States, but is not used for carriage or other timber. All of the varieties of hickory are much influenced by the conditions of soil, time of cutting and method of seasoning. None should be cut when in full leaf, and as this condition is governed by the climate no specific month for cutting can be named that can be followed for all. The earliest begins with the last part of August in New England, New Jersey and westward in the latitude north of the southern line of New York. Owing to the length of the winters north of this line, cutting may be continued up to the close of the year, but the best results are had when cut between the middle of August and the middle of December. In the middle belt cutting should be confined to the months of September, October and November. South of that October and November only. If more care was taken in cutting and seasoning hickory we would hear less complaints as regards its durability, and the supply would be better than it now is, and there would be less fear of the disappearance of this valuable timber in the near future.

OAK.

The oak is the most widely distributed and the best known of the hard wood trees of the world, and everywhere its value as a structural timber is recognized. In this country we have thirty-seven species botanically designated, some one or more of which flourish in every part of the United States except the prairies and alkaline plains of the West. Of these, white and red oak are the two most valued species for vehicle work. Under the general name "white oak" there are several species which possess similar qualities and appearance; these are the weeping oak and the mountain white oak, or blue oak of the Pacific Coast, the swamp white oak and swamp post oak, also called "overcup," of the South and Southwest. All of these furnish timber suitable for heavy wagon work, but careful selection is required, as so great a percentage of the timber is entirely unsuited for that purpose. The white oak of the North reaches its greatest excellence for structural work when grown upon rich, heavy soil, and in openings, the trees to be cut when young and thrifty, and not over twenty inches in diameter. The butt logs of the toughest kind seldom exceed eight feet in length, even when sawed close to the spring of the roots. Longer butts give good timber, but it is lacking those qualities which fit it for the smaller parts, such as spokes, etc. Red oak, although inferior in strength to white oak, is superior to the latter for heavy coach and wagon poles, as it is more rigid, and it not so liable to spring out of shape by use.

Oak is one of the most difficult of timbers to season, as the sap shows a disposition to ferment, and when it does it completely destroys the life of the timber. Owing to the great range of its growth and its numerous varieties, as well as its somewhat rapid growth, no trouble is experienced in procuring all that is required. The general rules for grading, however, do not apply to the carriage trade. For panels finished in the natural wood, quartered oak furnishes desirable material, as the grains and medullary rays are rich in ornamental effects.

ASH.

For carriage builders' use ash holds a foremost position as the structural timber for the body and gear, and to a limited extent as an ornamental wood for vehicles finished in the white, the forest growth having no superior for the framework of a body. The grain is fine, close and straight, and when well seasoned the wood does not spring out of shape, is sufficiently rigid and easily worked. The second growth at its best is not excelled by any wood for carriage parts. Both kinds bend readily and retain shape when dried.

Botanists divide the species into ten classes, but not more than four are of value in the carriage shop. White ash is the most prized timber we have for carriage parts, the second growth being but little, if any, inferior to the best hickory for all purposes excepting wheels. The trees thrive best on lowlands, where the soil is rich and where there is plenty of moisture. When grown in groups the

* The illustrations accompanying this article were kindly loaned us by Charles Henry Davis, C. E., of New York City, being a portion of those published in the *Street Railway Journal* for April 7, in connection with a most interesting article on "Street Car Building," by Mr. Davis. The article is an exhaustive one, and we recommend it to all who are interested in structural or finishing woods.

TRANSVERSE, RADIAL AND TANGENTIAL SECTIONS OF WOODS.

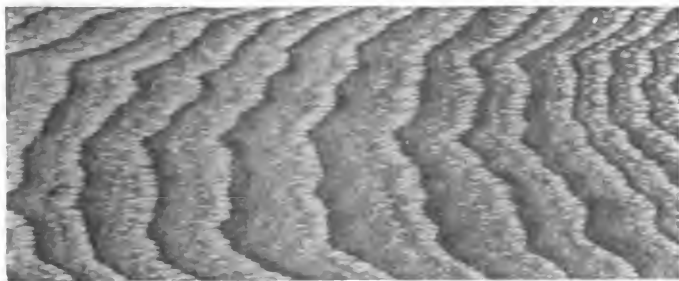
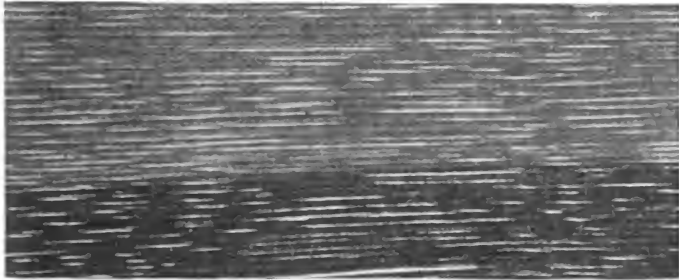
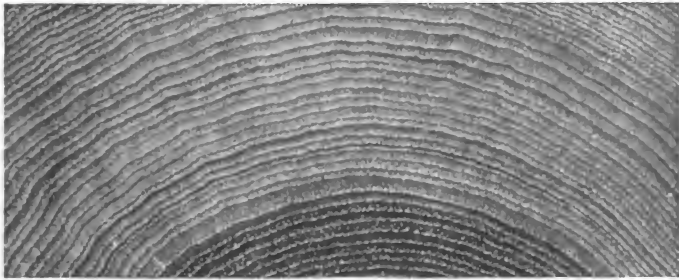


FIG. 1. HICKORY.

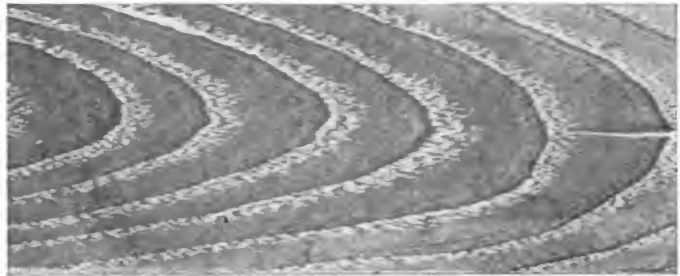
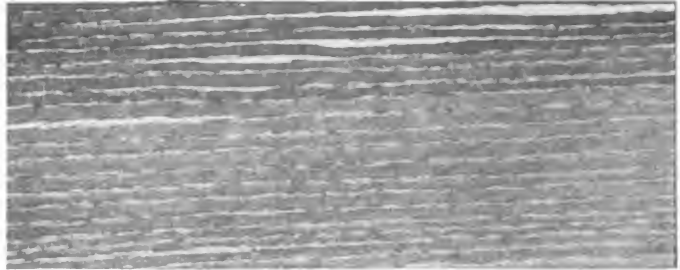
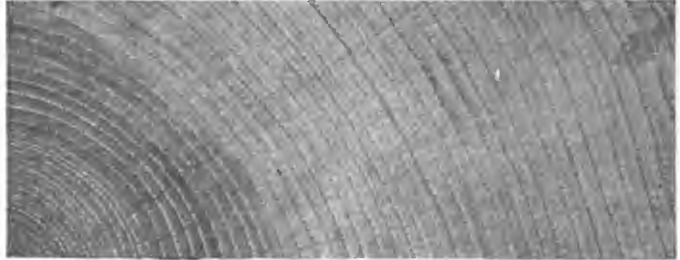


FIG. 3. WHITE ASH.

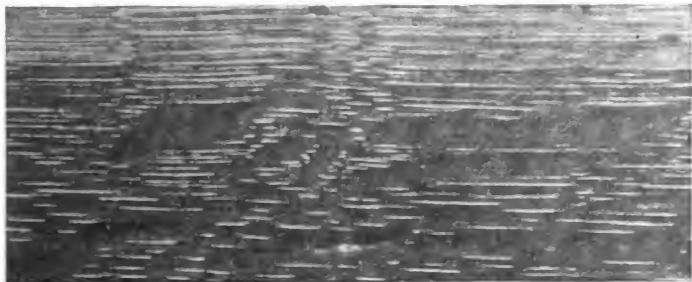
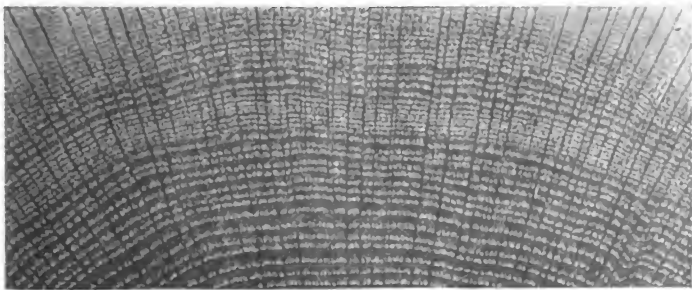


FIG. 2. WHITE OAK.

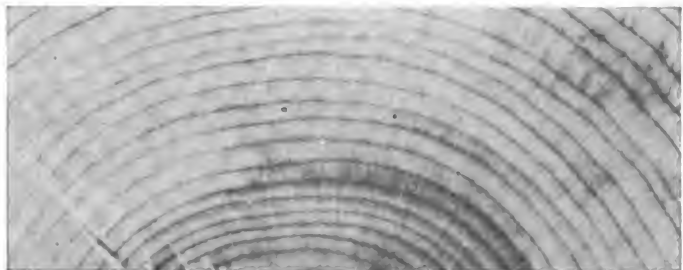


FIG. 4. YELLOW POPLAR (WHITEWOOD.)

NOTE.—In each figure the top section = Transverse Section; the middle section = Radial Section; and the bottom section = Tangential Section.

trees attain a height of eighty feet or more, and a diameter of twenty-four to thirty inches. The second growth seldom grows taller than to give a ten-foot butt cut below the first limb, and a corresponding girth. The wood in both is white, almost to the core; it is hard, tough and durable, if cut when the tree is in its prime, but if old it is brash and rigid. It is a rapid grower, and could be profitably cultivated if owners of suitable land would take interest in its production. As it now is there is very little really first class second growth to be had, and such of the first growth as can be obtained can be had in quantities only along the bottom lands of the Mississippi Valley, where "cane" ash can be procured of high grade.

Red ash so closely resembles white ash that the difference in the growing trees could not be detected by the casual observer, but the timber shows a greater proportion of red wood than white ash. That grown upon low grounds where the soil is rich possesses the same distinguishing merits as the white ash, and for carriage parts and bent timber it is but little, if any, inferior to it. That grown on high ground, where the soil is light, seasons out brittle and sometimes so brash as to make it valueless.

Elder leaf ash, also known as brown ash, black ash, and in some localities water ash, is the one great timber for the framework of bodies. The trees grow to an immense size, the grain straight and fine, and although not possessing great tensile strength, it has all that is requisite for the purpose, is easily worked; although solid it is quite light; retains its shape, and readily covers with paint. Its density tends to protect it from injury from moisture. For many years the supply was furnished from the forests of Ohio and Indiana, but the present supply is drawn from other localities, the best being from the valleys of our great rivers. A fairly good quality is procured from the southern Atlantic Coast States, but the porous strata is heavily charged with fine sand, which materially interferes with working it.

Blue ash is a dense, heavy and durable timber, but its disposition to spring out of shape makes it undesirable for body work, while it has no qualities that recommend it as a substitute for white or red ash. As a structural timber for heavy framework it finds its best place, and were it not so difficult to season in large sizes it would be far more valuable than it is. All the ashes mentioned should be cultivated and States should aid to that end, both with ash and hickory, so that a future supply would be assured.

WHITEWOOD.

This wood is the most valuable of all the woods used by carriage builders for panels. Botanically it is the *Liriodendron helipifera*; it is also called the tulip tree, yellow poplar and poplar, but the common name, whitewood, is the one it is best known by among users. It is one of the most beautiful of our forest trees. It grows to immense dimensions, has a long, clean, straight trunk, straight and fine grain, and is wonderfully free from defects. It seasons quickly, takes moisture readily and can be bent to almost any desired form, and because of this last quality and the great width of panels that can be procured it alone is recognized by the carriage builder as the panel timber *par excellence*. None other equals it. Cotton wood, another of the tulip family, has been recommended as an equally good panel wood, but it lacks the uniformity of grain of the whitewood, does not bend as readily and loses its form more quickly and is more readily influenced by atmospheric changes. Some of it, however, so closely resembles the white grades of whitewood that it is readily sold as such, and oftentimes causes much trouble thereby. The best whitewood for panels has a soft yellowish tint, is uniform in grain, free from knots, gum spots or colored streaks of any kind. In days past it was largely marketed as chair plank, the thickness being $2\frac{1}{2}$ to 3 inches; these were resawed by carriage builders. The widest stock, however, comes in twelve to fourteen foot plank, $\frac{1}{2}$ to $\frac{5}{8}$ inch, and great quantities were lost because of splitting while in transit. At the present time more care is taken in sorting at the mills and in shipping, so that loss from checks is slight. If more care was taken in sorting by the lumber manufacturer there would be little difficulty in procuring prime wide panel stock, notwithstanding the source of supply. A half century ago Central New York and Ohio furnished a superior line of prime wide whitewood, but at the present time we are dependent upon West Virginia, Kentucky, Tennessee, North Carolina and Virginia, but the demand is so great that these sections will soon be denuded of prime timber, and the carriage builder will be compelled to look for panel stock to the cottonwood of the South. The whitewood is a slow grower, and does not seem to replace itself in the forests, while the little that comes up in old

clearings is coarse grained and lacks all the peculiarities that make the forest growth desirable. The most valuable panel stock runs in widths from twenty-two to thirty inches. The narrow widths run from fourteen to twenty-two inches.

ELM.

Elm is the favorite timber for hubs in sizes of six inches or under; that known as white or rock elm. This timber possesses qualities that make it specially valuable for this purpose. The fibres are closely woven, which makes it difficult to split, at the same time the wood, although solid, is sufficiently yielding to allow of the spoke being driven without the grain of the hub injuring the face of the spoke as it will do where the end grain is unyielding. The disadvantages of the elm are its liability to absorb grease from axles; this is due to the open porous strata, and is most noticeable where the grain layers are thick and the porous strata open, and the liability of the layers to disintegrate while seasoning. The tree is a quick grower and flourishes in almost every part of the country, but the best quality for hubs is found in our Northern States and in Canada. Owing to its liability to spring it has never met with favor among carriage builders, although builders of the swell body sleighs known as the "Albany" found it a superior timber for their purpose, and they never experienced any trouble after the sleigh was built. Rock elm trees of large size, that is twelve inches diameter and up, are as a rule fairly close grained and comparatively free from disintegration. Red elm which has grown in soft, wet ground, however, is of no value for thin stock, but rock elm can be used in many places where ash is now employed, and carefully selected logs can be sawed so as to produce very rich grain effects where the finish is in the natural wood. The wood can also be used for low panel seats, as it is sufficiently close grained to take the paint well and hard enough to hold the screws needed for securing the iron-work. Elm, that is the best varieties, deserves much more consideration from carriage builders than it receives.

LOCUST.

At one time locust was highly prized for hubs, but owing to its splitting so easily it is used but little at the present time.

GUM.

Gum, that is, what is known as sour gum, is a valuable timber for large hubs. It differs from the sweet gum or pepperidge, and is found only in two or three of the Middle States. The best grows in the seacoast marshes of New Jersey. It has a very fine grain, closely interlocked, so much so that it is difficult to split it with an axe. It dries slowly and requires careful handling to prevent small checks. Sweet gum splits easily, and owing to this, "gum" is condemned by many, whereas the fault lies in the kind.

BIRCH.

Black and white birch also furnish good hub timber. The best of these grow in the southern tier of counties in New York and in the adjoining counties of Pennsylvania.

BASSWOOD.

Basswood furnishes an extremely pliant panel wood, and is unequalled for panels requiring a very short bend. Its susceptibility to climatic changes makes it unreliable unless well backed up and secured. For sleighs of the Albany pattern it has no equal, and when painted and well protected from the weather it is sufficiently durable for panels. It flourishes in the Middle and Central Western States.

The steadily decreasing supply of the timbers mentioned is a matter of serious import to the carriage builder. The only timbers we now have that have not grown scarce are oak and elm, but prime second growth oak is hard to get. Elm would be in the same place were it not that the use of the various kinds of iron banded hubs has made it possible to use smaller stock and softer wood than are necessary for the wood hub.

TO BE SOLD ON MAY 17.

THE Troy Carriage Co.'s plant, Troy, O., having failed to sell as advertised April 7, has been reappraised at \$18,000 and will be offered for sale May 19. The stock will be sold at public sale, commencing May 17.

TRANSVERSE, RADIAL AND TANGENTIAL SECTIONS OF WOODS.

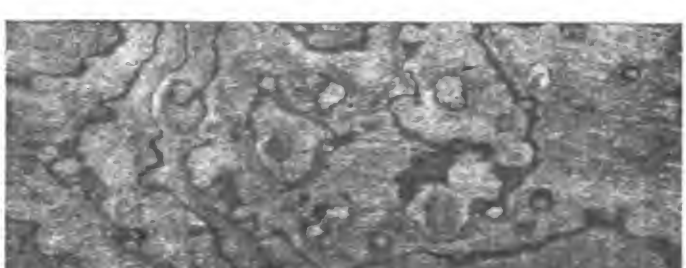
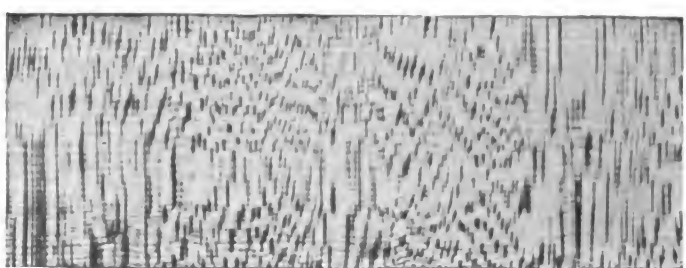
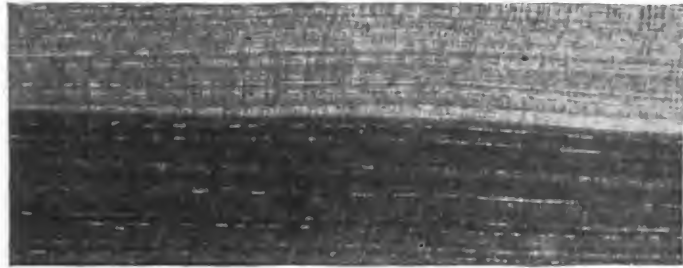
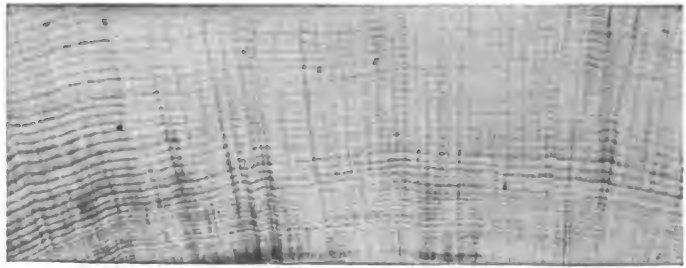


FIG. 5. ROCK ELM.

FIG. 7. CURLY MAPLE.

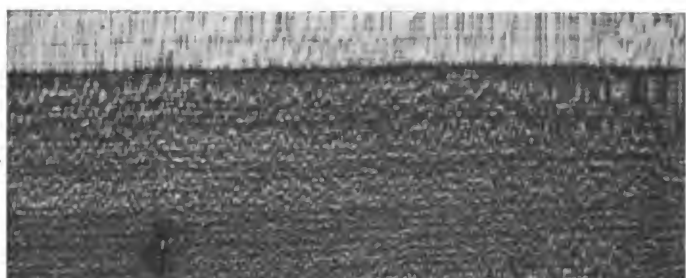
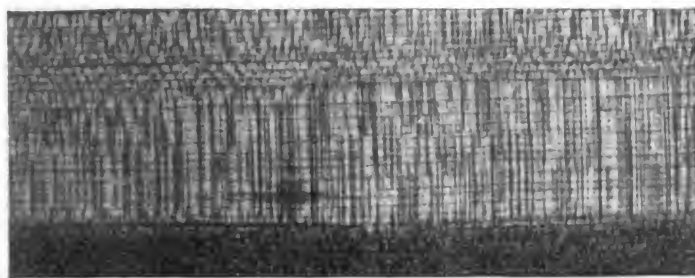
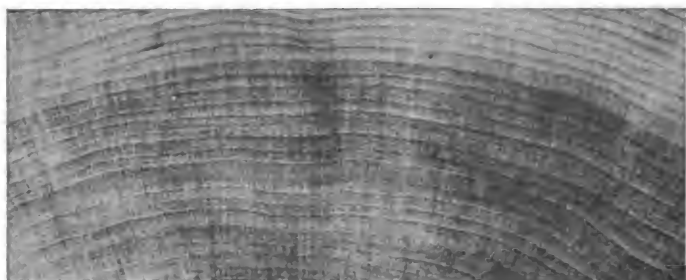
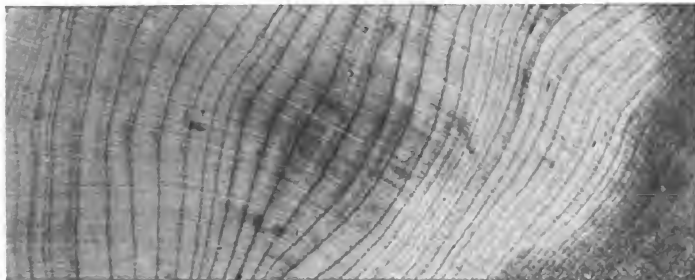


FIG. 6. MAPLE.

FIG. 8. WILD CHERRY.

The cuts are reproduced from photographs by Henry S. Graves, of the Division of Forestry, Department of Agriculture, United States Government, and loaned to THE HUB by Charles Henry Davis, C. E., of New York City.

Streets and Roads—Their Construction and Maintenance.

REPORT OF THE DIRECTOR OF THE OFFICE OF PUBLIC
ROAD INQUIRIES FOR 1899.

BY ROY STONE.

(From the Report of the Secretary of Agriculture.)

WORK OF THE YEAR.

THE work of the office during the past year has been marked by a steady progress along its well-established lines. The small office force has been kept busy prosecuting inquiries, answering correspondence, and gathering and disseminating important information relating to the various phases of the road subject. Many thousand copies of good road literature have been distributed among farmers and other persons interested, and important road conventions have been attended by representatives of the office, where information regarding the ways and means of road improvement have been both collected and distributed. Many State legislatures have asked for and received our assistance in framing new road legislation. Farmers' organizations, farmers' institutes, business organizations, schools, colleges, etc., have petitioned for our co-operation and advice, and many of them have been accommodated. The progress of road construction has been closely watched, and the field operations have been vigorously prosecuted. The value of the object-lesson methods adopted by the office have become so clear that there is a general and very urgent demand for their continuance and extension. This work has been pushed forward as rapidly as the time and means at hand would permit, but in order to have complied with all the demands for assistance along these lines our force and means should have been at least ten times larger.

LITERATURE.

The spirit of inquiry on all road matters among agriculturists and road reformers is steadily increasing, and requests for information covering a wide range of subjects have been more numerous than ever before. In view of the wide interest attaching to the subject and of the fact that many of the previous publications of the office were not available for free distribution, Farmers' Bulletin No. 95, entitled "Good Roads for Farmers," was prepared at your direction by Assistant Director M. O. Eldridge. In preparing this bulletin the object sought was to present in the plainest possible manner the fundamental principles of road construction and maintenance and at the same time to make, if possible, an instructive compendium of road literature. Thousands of copies of this bulletin have been asked for and distributed; many persons have been supplied who had not before heard of the Office of Public Road Inquiries, and numerous testimonials regarding the usefulness of the office and its work for the farmer have been received. This exemplifies the statement which has been previously made in reports from this office, that the most practical road inquiry bulletins should be placed on the same footing as Farmers' Bulletins. "They are not calculated to be of private advantage to anybody, but are to be used solely in educational work. Few people can be expected to buy them for that purpose, while many would take the trouble to use them if they could be had free of cost."

"Must the Farmers Pay for Good Roads?" is perhaps one of the most popular little pamphlets ever published on the road subject. It was written by Mr. Otto Dorner, of Milwaukee, Wis., chairman of the national committee for highway improvement of the League of American Wheelmen. It was published by that league and adopted as Circular No. 31 of this office, and hundreds of thousands of copies have been distributed throughout the country. Mr. Dorner's idea is, briefly, that since the city and suburban population enjoy the benefit of good roads equally with their country neighbors, the farmers, the labor and expense of building good roads should be in no wise imposed solely upon the farmers, who cannot afford it, but that the burden should be shared by city and village taxpayer, or in fact by every citizen of the State and nation. As the bad condition of the country roads affects the town to which the county is tributary as well as the country itself, it would seem that Mr. Dorner favors a happy solution of a most perplexing problem, as well as a measure of justice to all parties concerned.

"State Aid to Road Building in Minnesota," by A. B. Choate, was published as Circular No. 32. Mr. Choate's scheme of legislation is quite similar to that advocated by Mr. Dorner in Circular No. 31, and his idea is, in short, that the present system is a great injustice to farmers; that a large proportion of taxable property is in the cities and towns, and that "State aid" means equal taxation.

The governors of a number of States recently in their messages to the several Legislatures called attention to the great importance of better highways. These messages have been collected, and extracts relating to road improvement have been prepared and printed as Circular No. 33. These extracts indicate the present condition of legislation as to roads, and give some idea of public sentiment in the States where they were prepared. Governor Mount, of Indiana, touches the keynote which should be sounded throughout the land until every public road shall have been improved, when he says that "the farmer whose family is held in the thralldom of mud for a large part of the year is subjected to the ordeal that trammels progress, fetters social growth, and retards intellectual development." The arguments made by many of the other governors to the Legislatures are no less impressive than that made by Governor Mount, and all of them are equally convincing.

STEEL ROADS.

Hon. Martin Dodge, of Cleveland, O., filled the position of director from August, 1898, to January, 1899, General Stone being on leave and serving on General Miles' staff as a brigadier-general in the war with Spain. During Mr. Dodge's incumbency plans were completed and carried out for samples of steel-track roads in short sections at Omaha, Neb., Ames, Ia., and St. Anthony Park, Minn. These experimental sections of steel road clearly demonstrated their usefulness for the Western States and for the other level States which are but sparingly supplied with good stone or gravel. The time was so limited and the means at our disposal so inadequate that we had to prepare a design for these steel roads, using rails of the regular shapes found in the market. Imperfections were naturally found which can be easily remedied if steel again becomes so cheap that the manufacturers can take the matter up and make rails of special shapes, or if sufficient means are appropriated by Congress to perfect the system.

ROAD GATHERINGS AND ORGANIZATIONS.

The National Road Parliament was held under the auspices of this office in connection with the Trans-Mississippi Exposition at Omaha, Neb., October 10, 1898. Although not a large gathering, it was a very successful one. Most of the Western States were represented, something which had not heretofore occurred in meetings of this sort, and the delegates who attended were the representative and enthusiastic road workers of their respective communities and States. A large number of local meetings and State conventions have been held, and road leagues have been formed in many progressive communities, and it is believed that much good has been and will be accomplished by "agitation, organization and education," which are the best means of securing wholesome and effective results. The State and Interstate Good Roads and Public Improvement Association, of which Mr. W. H. Moore, of St. Louis, is president, is holding good-roads conventions in many of the wideawake and prosperous cities of the middle Western States. The people of that section are more thoroughly aroused over this question than ever before; they are waging an effective campaign for the betterment of their highways, and Mr. Moore says there will be no "let up" in this great educational movement until such laws are enacted as will insure better highways throughout the West.

OBJECT-LESSON ROADS.

The object-lesson road work of the year has been as extensive in territory covered as it has been far-reaching in results accomplished. Model roads of various kinds have been built under the supervision of Mr. E. G. Harrison, special agent and road expert, in the States of Maryland, Nebraska, Minnesota, Iowa, Kentucky, Indiana, and Wisconsin.

One of the Maryland roads was built from Fork to Kingsville in Baltimore County. The macadam method was adopted and trap (igneous) rock was used in the construction. The stone was crushed with a Champion crusher and separated into the proper sizes with a revolving screen, the various sizes were spread on the prepared earth foundation in layers with a Champion distributing cart, and each layer thoroughly rolled and consolidated with a steam roller. On July 30, 1898, a large number of people, including many State and county officials, assembled to witness the construction. The severe weather of last winter had little or no effect upon this road, and it is

now almost as smooth and hard as asphalt, while other roads in the county, which were built with the same machinery and of the same kind of stone, are rough and uneven, and in some places covered with loose stones of various sizes. A section of common earth road was improved in Harford County, near Fulsom, by simply underdraining the road with tile drains. A sample road was also built in Harford County out of the ordinary surface bowlders or field stone. They were crushed, separated into suitable sizes, spread on in layers with the larger sizes on the bottom, sprinkled, and rolled until compact and smooth. Screenings and stone dust were used as a binder or filler as well as for the top layer, thus leaving the surface ready for immediate use.

A State good roads convention was held at St. Anthony Park, Minn., under the auspices of the experiment station and university of that State, and during this convention students of the State University and other people interested were taught by our expert how to build a macadam road. The trap rock used in the construction was from Taylors Falls, and was furnished free of charge by the St. Paul and Duluth Railroad Co. As a direct result of this sample road work the officials of the city of St. Paul and Ramsey County let the contract at once for the construction of two miles of road modeled after the one built by our expert on the State fair grounds, and surfaced with trap rock from Taylors Falls. After laying 280 feet of steel track on the grounds of the Trans-Mississippi Exposition at Omaha, Mr. Harrison returned to St. Anthony Park, Minn., and placed on the State experiment station grounds a sample of steel track of the same length; 280 feet were also placed on the grounds of the State College at Ames, Ia. The construction of these roads is treated of in the Yearbook of the Department for 1898, under the title "Steel-track Wagon Roads," by Martin Dodge.

During the month of February the engineering students of the University of Louisiana, at Baton Rouge, were instructed in the art of building earth roads. Owing to the absence of stone, gravel, or other road-building materials, and to the fact that this experiment involved the application of new principles of construction to many who viewed the work, a wide interest was manifested. After having lectured before the farmers' institutes in Kentucky for about a month, Expert Harrison began the construction of an object-lesson road on the grounds of the University of Kentucky, at Lexington. A State day was held, and was largely attended by representative men from all parts of the State. There is, perhaps, no part of the country which is so much in need of better roads as the South, and it is to be hoped that the experimental section of stone road built in Kentucky will do something toward transforming the roads of that part of the country from boggy and dusty lanes into scientifically constructed highways.

Through the generosity of Hon. J. H. Stout, and with the co-operation of the railroad and road-machine companies, a half-mile section of road was built at Menomonie, Wis. This road was constructed so as to fully illustrate the best permanent highways built out of the best and most lasting materials, also the feasibility of utilizing such materials as localities have at hand. One section was built of gravel over a sand foundation, another of stone over a gravel foundation, while another was built with a gravel-wearing surface and a stone foundation, and still another illustrated the regular macadam construction. As a test of the latest proposal for road improvement, an earth road was rounded up, sprinkled with crude oil, and thoroughly rolled.

State Day was well attended, and it is believed by many who were present that this experimental section of road will be of incalculable value to Wisconsin, and, finally, when results are made known, to the whole country.

ROAD INQUIRIES.

The principal inquiries made during the year were upon the following subjects: New road legislation, and especially that for State aid; the use of convict labor in road building or in the preparation of road materials; experiments in steel roads and other new plans; methods of raising road funds; bond issues and rates of interest paid; condition of new roads under wear, especially of the sample roads supervised by this office; the promoting of rural free delivery of mails by good roads; the progress of organization for road improvement; the prospects of road construction during the year, etc. Numerous responses were received from many of the best workers for road improvement, and the subjects were most interestingly and intelligently treated, so much so, in fact, that many of them are being prepared as a circular or bulletin of the office.

The consensus of opinion in this correspondence is that "State aid" is the best law under which to build and maintain roads. The

method of working convicts in quarries and gravel pits in preparing road material is earnestly supported by everyone, and the use of convicts in actually building roads is strongly advocated by many people, especially those from the South. As a result of road improvement, the appreciation in land values has been in most cases marvelous. One instance is given where land was bought for \$12.50 per acre, and only a few years later, when good roads had been built, was sold for \$100 per acre. Many other instances are given where the increase has been from 30 to 50 per cent. So far as we are able to judge from these reports, there is not a community in the United States where good roads have been built that would return to the old "hog in the mud" method. The general opinion is that the free rural delivery of mails should be extended to those communities where the roads are so good that they will be firm and smooth during all seasons of the year. Good progress is reported regarding organization for road improvement. Hundreds of local road leagues have been formed, and many States have been thoroughly organized, all of which will result in spreading the good roads work and in strengthening the movement. The prospects for new road work for the present year are brighter than ever before, and some of the road-machine companies have more orders for machines than they can fill for many months.

As a result of these investigations we are firmly convinced that for local need, as well as for our material development and prosperity, a well-regulated system of public roads throughout the whole country is day by day becoming more necessary. While we have the most perfect railway system in the world, our public highways are and always have been inferior to those of any other country in the civilized world. As our public roads are the veins and arteries of our agricultural, commercial, and social life, they are not yet receiving the consideration that their great importance deserves. Much has been done in the United States toward road building during the last few years, but much more needs to be done; indeed the beginning has just been made.

PLANS FOR 1900 AND ESTIMATES FOR 1901.

It is the intention, during the ensuing year, to continue and enlarge the scope of the work already accomplished. The miscellaneous work of the office, as well as the field operations, have increased more rapidly than our facilities. We have accomplished what we have done only by the co-operation and volunteer aid of the road-building machine companies in loaning machinery, and of the railroads in the matter of transportation, both of machines and persons. The road-building companies, while still anxious to co-operate, are all short of machines, and will be less able next season to loan us a supply, while we have, perhaps, overtaxed the patience and courtesy of the railroad companies.

We have made only a small beginning in the progress of work designed to be done at the colleges and experiment stations, and we have been obliged to forego numerous opportunities to take charge of construction of sample roads in other localities where practically all the expense, except our supervision, was guaranteed. Under these circumstances there would be practically no limit to the amount of money which could be profitably expended in this matter, but it is better to advance it moderately, and I therefore recommend an appropriation of \$20,000 for the coming year, of which \$5,000 should be made immediately available. This will enable us to put several additional experts in the field immediately upon the passage of the act.

ARTIFICIAL STONE FOR PAVING.

AN artificial stone made in Belgium has been tested in the Malines Arsenal. It is said to have four times the resistive force of French freestone, is insensible to the action of cold, absorbs only 6 to 7 per cent. of water, even after long dry spell, and cannot be crushed under a pressure of forty kilogs. to the square centimetre. This artificial stone is manufactured in the following manner: Eighty parts of extremely clean and dry coarse sand are mixed with twenty parts of hydraulic lime reduced to a fine, dry dust; this mixture is put into an iron box, which is plunged into a boiler of water, and this is hermetically closed. During seventy-two hours the cooking goes on under a pressure of six atmospheres, the temperature being maintained at 165°. At the end of this time the iron box contains a perfect homogeneous mass of stone, which rapidly hardens upon exposure to the air.—*Automobile Journal*.

CONSOLIDATED RUBBER TIRE CO.

As some of the stockholders of the Consolidated Rubber Tire Co., 40 Wall street, New York, have formed themselves into what they term a protective committee, and as the Consolidated Rubber Tire Co. desires to anticipate any ill effects which the action of said committee might have among the stockholders at large, Isaac L. Rice, president, has sent out the following circular, showing the condition of the company on December 31, 1899, and also showing in a general way the amount of business they are doing as compared with the same period last year. We learn from an officer of the company that they are extremely busy, and that their sales are continually on the increase. We publish the main features of the circular for the benefit of our readers. This company controls the Rubber Tire Wheel Co., of Springfield, O.

To the Stockholders of the Consolidated Rubber Tire Co.:

In order to prevent the alarm that might otherwise result from the extraordinary advertisement appearing above the names of Frank Tilford, George R. Sheldon and A. R. Pick, Protective Committee, I deem it incumbent on me to say that the financial condition of the company is sound, its credit excellent and its business prosperous. If the above-named gentlemen had given themselves the slight trouble of presenting to me their request for information concerning the matters about which they are apparently so eager to inform themselves, before taking an action so damaging to the investment value of your shares and so injurious to the business of the company, I should have been glad to have furnished it to them.

In this connection it is proper for me to say that when a short time ago I was tendered on the part of the board of the company the office of president, I conditioned my acceptance on an examination of the books by the Audit Co. of New York. The result of this examination I intended to embody in my report to the stockholders at the annual meeting on May 7, where it properly belongs; under the circumstances, however, I feel it essential to depart from this usual course and present the same herewith as follows:

THE AUDIT CO. OF NEW YORK.

ISAAC L. RICE, ESQ.,
President Consolidated Rubber Tire Co., 40 Wall street, New York City.

DEAR SIR—Pursuant to your instructions, we have made an audit of the books and accounts of the Consolidated Rubber Tire Co. from the beginning of that company, July 1, 1899, to December 31, 1899.

Attached please find the following statements:

Adjusted profit and loss statement, July 1, 1899, to December 31, 1899; statement of current assets and liabilities, December 31, 1899.

These statements are based upon the reports of the branch offices made to the New York office, which branch offices we have not examined, with the exception of the New York City branch, selected and audited by us.

The company's books show no debts, either fixed or floating, beyond the accounts payable, as shown in the statement of current assets and liabilities.

Yours very truly,

(Signed)

THE AUDIT CO. OF NEW YORK,
THOMAS L. GREENE, Manager.

New York, March 24, 1900.

It is only necessary to add that the first three months of the present year show an increase of 60 per cent. over the gross earnings of the same period of last year.

I think it will be evident from the above that this whole matter is one of the series of attempts of a rival corporation to obtain control of your extremely valuable property at an absurdly low price—an effort which has been consistently resisted by your management, and of which, I fear, the above-named gentlemen have unwittingly become the instruments.

ISAAC L. RICE,
President.

LIEBER'S STANDARD CODE.

In these days of rapid transmission by telegraph code words are a necessity in order to reduce cost to a low figure. A code, however, to be of real value must contain an ample number of ciphers. Such a one is Lieber's Standard Code, which has received the endorsement of such a large number of business houses, as well as the United States government. We call special attention to the advertisement of this code; which appears on another page of this month's HUB.

Descriptions of Automobiles.

AMERICAN ELECTRIC VEHICLE CO.'S SIDE BAR BUGGY.

(See illustration on page 55.)

THE comely electric automobile shown on page 55 is one of the company's latest designs and one of special merit. Its construction permits ample battery space in the sunk bottom, which extends the entire length of the body. The body is supported on half elliptics, cross bar and cross springs, and additional half springs from the axle near the hub diagonally to the body, thus insuring ample support and improving the riding qualities. The side bar serves to cut the lower part of the body, and robs it of the heavy appearance that would exist otherwise. This is one of the neatest of the new styles of automobiles brought out this spring.

CLEVELAND (O.) MACHINE SCREW CO.'S PHAETON.

(See illustration on page 55.)

THIS phaeton is neat, compact and powerful. Its weight is about 2,000 pounds, and it is driven by a two and one-half horse-power electric motor and a forty cell storage battery, being able to travel thirty-eight miles with one charge. The original is owned by a member of the Automobile Club of New York City, and earned a reputation as a climber by climbing Fort Lee Hill, a feat that few motor vehicles have been able to accomplish, and was able to continue its journey of more than thirty-eight miles and reach home with a goodly supply of power yet in storage.

CENTURY MOTOR VEHICLE CO.

(See illustration on page 57.)

THE Century Motor Vehicle Co. has been recently incorporated at Albany to manufacture motor vehicles propelled by steam, electricity and gasoline. The incorporators are Charles F. Saul, president; Charles Listman, vice-president; Charles Bridgman, secretary-treasurer; H. C. Plumb, and William Van Wagoner, manager. The machines will be manufactured under the patents of the latter. Mr. Saul and Mr. Bridgman were respectively president and secretary-treasurer of the Barnes Cycle Co., before the business was sold to the American Bicycle Co. Mr. Van Wagoner was the general superintendent of the Barnes Cycle Co., and remained with the American Bicycle Co. until the 1st of March, when he resigned his position to perfect the organization of the Motor Vehicle Co. The company has engaged a corps of skilled mechanics, and it is their intention to employ none but the most skilled workmen and to use the best of material. They have leased a manufacturing building at 519 East Water street, Syracuse, N. Y., which they are rapidly equipping, and have a number of vehicles on the floor and in the course of construction.

All the vehicles are propelled by a pair of bevel gears on the rear axle, and the motor is suspended from the body toward the front end. In the electric vehicles a double reduction system of gearing is used, there being a pair of spur gears at the motor end of the gear shaft in addition to the bevel gears on the rear axle. The frames of all the vehicles are constructed of seamless steel tubing and forgings, ball bearings being used throughout. The frame is flexible, to allow for inequalities in the road. The entire driving mechanism or power transmission is enclosed and is dust proof. In the electric vehicles forty-two cells of battery are used, which are arranged in six trays, and the battery connections to the controller allow of three speeds forward, three backward and the stopping point, which is also the charging position. The steam motor is a two-cylinder, double acting, reversible engine, suspended from the body on pivotal bearings on a similar plan to the electric motor, and the engine shaft is coupled direct to the gear shaft which drives the rear axle. The driving mechanism and engine are entirely enclosed, so as to be dust proof. The gasoline propelled vehicles have the engine arranged inside the rear of the body, and the changeable speed gear is pivoted to the body, transmitting the power to the

Automobile Department.

rear axle by means of a gear shaft and bevel gears, similar to that used in the other two styles of vehicles; these, also, are dust proof.

The wagon gear (or frame and wheels) is made by the Century Co. from their own designs, and is one of their special features. The motor used in the electric vehicle is specially made for them from their own designs, and the motor controller is made in their own factory, being a very simple and efficient arrangement of knife switches, which do not "arc" when the speed is changed. All the vehicles are steered and the speed controlled by means of one steering lever. The brake on all the vehicles is a band brake operated by foot lever. The majority of the vehicles will be fitted with wire wheels and pneumatic tires, although in special cases delivery wagons will be fitted with wooden wheels and solid rubber tires. Their illustrated catalogue, showing nine styles of their vehicles, is now in the hands of the publishers and will be issued within a few days. The special facilities of the factory are such that orders can be filled in a reasonable length of time.

DE DION-BOUTON GASOLINE CARRIAGE.

(See illustration on page 57.)

THIS vehicle was one of the participants in the automobile race on Long Island, April 14. It was driven by C. J. Field, with Kenneth A. Skinner, of Boston, sole agent for the United States of De Dion, Bouton & Co., of Paris. The machine made a good run, but met with an accident on turning, by which a tire was torn from one wheel. The motor, however, sustained its reputation as a first-class power.

NEW ENGLAND MOTOR CARRIAGE.

(See illustration on page 56.)

THE motive power of this vehicle is steam, and it uses a steel boiler containing 320 1/2 in. copper tubes. The engine is of the two cylinder piston valve type, and is four horse-power. The engine and boiler are bolted together, preventing any possibility of loose connections between the boiler and engine. The burner is controlled automatically, so that when the steam reaches a desired point the flame is reduced. The boiler is also supplied, of course, with a safety valve. The fuel used is gasoline, and enough is carried for a run of from sixty to seventy-five miles, according to the road. The water tanks entirely surround the boiler, and contain enough water for about twenty-five miles. The carriage is capable of being run at a speed of thirty or thirty-five miles an hour, and can easily maintain a speed of fifteen miles an hour over the ordinary country road. All the mechanism of this carriage is securely fastened to a frame, which is entirely independent of the running gear and the body. By removing the steering and steam levers the body can be taken off, exposing the mechanism for the purpose of cleaning or adjustment. The running gear is of heavy tubing, and is so constructed that the inequalities of the road do not affect it. Wheels, 30 in., with wood or steel rims, at the option of the purchaser, and 2 1/2 in. tires. It is fitted with a powerful band brake, which is applied to a metal drum connected with the sprocket and gives complete control of the vehicle. All the working parts of the engine are protected from mud and dust, and there is absolutely no noise or vibration when the carriage is running. This carriage will ascend any grade at a fair speed. Steam can be raised in from six to ten minutes from cold water. The weight of the carriage, with water and fuel tanks full, is about 700 lbs. The price of the carriage is \$750 net f. o. b. factory. A folding top can be furnished when desired. Howell & Meehan, of Boston, Mass., are the sole agents.

"WAVERLEY" DOS-A-DOS.

(See illustration on page 56.)

THIS stylish vehicle is one of a line of "Waverley" automobiles manufactured by the American Bicycle Co., of Indianapolis, Ind. It has an electrical motor, with speed from three to fifteen miles an hour, and an average mileage of thirty-two miles to one charge of battery, and will climb a 12 per cent. grade. The wheels are 34 and 40 in., 1 3/4 in. solid rubber tire front and 2 in. rear; weight, 2,000 pounds. It is finished and trimmed high grade, and constructed in the best manner, making it a model vehicle.

STORAGE BATTERIES FOR VEHICLE USE AND THEIR CARE.

As the name "storage battery" immediately suggests to most people's minds a reservoir or tank for containing a quantity of electric current, it is really necessary to begin by quarreling with the name. The action of these batteries being truly chemical, but requiring the stimulus of an outside or primary current to make them generate a current, the name of secondary battery better expresses the real conditions. The ordinary storage cell consists of two groups of lead plates, arranged alternately in the jar and called positive (+) and negative (-), each plate being of opposite sign from the next on either side of it. Plates of the same sign are connected by strips of lead to form the groups. Various mechanical methods of insulation are used to prevent the touching of plates of unlike sign, and at the same time allowing for the free circulation of the acid solution in which they are immersed.

Charging consists in passing a current from one series through the solution to the other series, thus effecting a chemical change in the nature of the surfaces of both series. When the change has taken place over the entire surface the cell is fully charged. The cell is now ready for action and resembles a primary battery. Connecting the two series of plates (closing the circuit) causes chemical action (a reverse action, as the chemical composition becomes the same as at first), and an electric current is produced. This is really "new" electricity, as the first current was used in producing the original action, so no electricity, strictly speaking, is stored.

Although the battery of an electric automobile can in no way be compared with the horse of an ordinary vehicle, it might readily be compared with his digestive organs, as it receives and distributes the stimulus which the motor, acting in the place of muscles, applies. While it is utterly unnecessary for a horseman to know the chemical action that takes place in the stomach of a horse, yet a knowledge of the quality and quantity of the food necessary to produce the best results will make an immense difference to the life and value of the horse. So also the owner of an electric vehicle need not know the formula of the chemical action in the batteries. A concise knowledge of how to care for the batteries is even more important to him than a similar knowledge of horses to the horseman, for the horse has certain ideas on the subject himself, many of which are not far from right; but the electric vehicle has to depend on the operator for proper treatment.

Just here is the place to say a word about whom to go to for proper treatment when trouble occurs. As the thoroughbred requires the treatment of a veterinary surgeon when ill, so the battery requires the skilled electrician, and in both cases the best is the cheapest. Because John has worked around carriages for twenty years, it does not follow that he knows all about automobiles. By all means take your carriage to the maker if possible; if not, to the best man obtainable.

The ordinary vehicle battery consists of either forty-four or forty cells, arranged in four groups, the average voltage varying from 2.5 volts at full charge to 1.75 volts when at the lowest point to which it should be discharged. The maximum is 110 (or 100) volts and the minimum 77 (or 70) volts for the battery. This arrangement has been generally followed, owing to the fact that the majority of direct current circuits practical for charging purposes are 110 to 120 volts pressure, this giving the excess of pressure necessary to force the current through the cells.

The arrangement in four sets is only in the carriages where the speed is controlled by using the sets as wanted. This is the prevailing device for controlling speed. Each cell is connected with the next; the positive (+) pole being connected with the negative (-) pole of the next, and that positive with the next negative, and so on till each series is complete, when it is connected with the controller. Positive poles are either marked + or colored red. Negative poles are either marked - or not at all.

To charge, connect all four series in one circuit. This is usually accomplished, especially where the batteries are intended to be charged in the carriage, by disconnecting the motor and setting the controller at full speed, the reason for it being that when going at full speed all of the cells are used in series.

The acid, or electrolyte, as it is called, in which the plates are submerged, is a mixture of sulphuric acid and water, the strength of which varies with the state of charge of the battery, the maximum strength being attained while the cells are fully charged and growing weaker as discharging takes place, in inverse proportion to the amount of current used. As the only ordinary loss of bulk in the solution is by evaporation (or slight spilling), and is very small, it should be replaced by the addition of clean water. This must be watched and attended to promptly, as the plates must always be covered, otherwise they will be quickly destroyed where exposed. The solution is only replaced when the cells are cleaned or repaired. If any considerable loss by spilling should occur, regular solution should be added to prevent weakening the electrolyte. The covers of the cells are supplied with special "plugs" in order to facilitate filling, and special rubber fillers working on the plan of those used for fountain pens or dropping medicine, but larger in size, are furnished with them.

With the ordinary commercial acid the solution consists of 1 part water to 5 parts acid, but as this acid varies it should be mixed by hydrometer. The register by Baumé hydrometer is 22°, or a specific gravity of 1.18. This is important, and should be exact. The solution must be mixed in a stone or glass vessel or a lead tank. Pour in the water first, as the heat developed while mixing is sufficient to cause accident if the water is poured over the acid. Then pour in the acid slowly and stir with a glass rod. The stirring should be kept up continually during the addition of the acid. As the solution cools it becomes stronger. The hydrometer test of the hot mixture should therefore be about 2° lower than the cold test. Allow the solution to cool down, and then adjust by addition of water or acid, as desired.

Clothing, or metal of any ordinary kind, except lead, must be kept out of the solution. The pure acid is exceedingly corrosive, but can be neutralized by ammonia or any good alkali. A bottle of ammonia should be kept handy.

As long as the cells are working uniformly it is unnecessary to disturb the solution. When, however, a cell is found to drop below the average voltage, the solution should at once be tested. Withdraw some of the solution and test by hydrometer. If the solution is found weak fresh solution may be added, but if this is done at any other time than when the battery is fully charged, another test should be made when it is fully charged and the solution diluted, as it will be found too strong.

Theodore D. Bunce, of the Storage Battery Supply Co., of New York, has invented a hydrometer syringe, being a combination of a suction bulb and a hydrometer, with which the solution is withdrawn and the hydrometer test read without emptying the syringe. It is extremely handy, as well as a great time saver. The undiluted acid should never be used around the cells, as it is very destructive, and if introduced into the jars will destroy the plates.

After determining the polarity with an indicator, connect the charging wires with the switchboard. Be sure you have a fuse block in the circuit. A rheostat and an ammeter are also necessary. When the charging plug is inserted the rheostat should be set with all the resistance in circuit and the current turned on. If any hurrying is to be done it should be at the beginning of the charge, and the rate reduced to the normal as the cells show symptoms of becoming charged. The normal rate of charge will, however, always give better returns. Any special directions given with a particular carriage should be carefully followed in charging that carriage.

The sure symptom of a charged condition is bubbling or boiling; as the boiling becomes evident reduce the current. When the solution boils with a low current the charge is nearly complete. Continue the current for a short time at the low rate, so that any cells which have been a little slow may have a chance to catch up. If the previous discharge has been overdrawn a longer time will be required to charge, and the bubbling will have to be disregarded a little before it can be fully returned. As the gas formed by bubbling is explosive, care should be taken to have good ventilation and no fire should be allowed near it. An incandescent lamp should be used to examine the cells. Uniformity of bubbling is a fair test of complete charge. It can be best determined with a low current.

As the charge strengthens on standing, especially after partial using, the battery should be charged as soon as possible after using and then given a short charge just before taking out. A very heavy over discharge may take several charges and discharges before the effect wears off. Charging under such circumstances should be slow.

If the carriage is to be used to the full extent every day, two sets of batteries should be used, and a decided advantage is gained by slow charges and resting. A fault of any kind in a cell should be taken care of at once. A battery never repairs itself, but grows steadily worse.

While the above instructions apply to nearly every electric vehicle, any special further instruction will be found in the book of instructions issued with each make of vehicle.

A SUCCESSFUL AUTOMOBILE RACE.

THE automobile race which took place on April 14 was a success, and the lovers of the new sport are consequently encouraged. The run was fifty miles, twenty-five out and twenty-five back, over what is known as the Merrick road, from Springfield to Babylon, Long Island. The race was for automobiles driven by members of the Automobile Club, carrying at least two persons, motorcycles barred. Start to be thirty seconds apart. Allowance to be made for delays at railroad crossings. Rules of the Automobile Club of America to govern. The vehicles entered were as follows:

The Riker Electric, five horse power, driver, A. L. Riker, accompanied by A. H. Whitney.

Locomobile, steam, four horse power, driver, S. T. Davis, Jr., accompanied by Joseph McDuffee.

Auto Co. of America, gasoline, five horse power, A. Fischer driving, accompanied by a mechanic.

Winton, gasoline, six horse power, driven by David W. Bishop, Jr., and mechanic.

Winton, gasoline, six horse power, driven by Albert C. Bostwick, accompanied by Leonce Blanchet, donor of the first prize, a silver cup.

Winton, gasoline, six horse power, driven by G. F. Chamberlin and mechanic.

De Dion, gasoline, three horse power, driven by C. J. Field, accompanied by Kenneth A. Skinner.

Locomobile, steam, four horse power, driven by D. H. Morris, accompanied by R. H. S. Abbott.

Locomobile, steam, four horse power, driven by William H. Hall and mechanic.

The officials were: Referee and starter; Whitney Lyon; timer at finish, B. E. Macy; timers at railroad crossing, Homer W. Hedge and E. C. Chamberlin; timer at turn, C. S. Wells; judge at turn, John C. Wetmore, of *Motor Age*.

The management devolved upon Albert C. Bostwick, chairman of the run committee, and Capt. Homer W. Hedge. They performed their part so well that there was no cause for grumbling. The vehicles were started at thirty seconds interval, in order to avoid annoyance at the starting point. The turning point at the end of twenty-five miles was plainly indicated, and supply stations for water, gasoline, etc., were established every few miles in case of need. The start was made at 10:24. The first to get away was the Riker, with Bostwick second, Bishop third, Fischer fourth, Hall fifth, Field sixth, Chamberlain seventh, Morris eighth, Davis ninth. Many changes of position occurred, Hall's machine breaking down at the end of the eighteenth mile, and Field met with an accident, losing a tire on turning. The Riker was first to reach the turning point, having made the twenty-five miles in one hour and thirty-six seconds. He was closely followed by Davis, who made the run in thirty-eight minutes and thirteen seconds, having beaten the time of the Riker two minutes, the others following at longer intervals. The run home was made by the Riker in one hour two minutes and fifty-four seconds, beating his nearest competitor fourteen minutes and fifty-seven seconds. That the electric vehicle should win was the surprise of the knowing ones, as few thought it possible for an electric motor to run fifty miles. Steam won the second place, the third being left for the gasoline motors. It was claimed by the losers that their machines were not specially built for racing, but as all made good time there was no need of excuses. The best won, and that was an electric. It now remains for the friends of the other systems to wrest the laurels from the electric in some future race. The winner will be one of the competitors at the international race on June 14, at Paris, France. Steam won the second place. The race showed the merits of the various methods, although more than one such race will be necessary to settle the supremacy of any one.

One feature of the race that deprived it of the interest that it

should have had, was the ridiculous costumes, and we know of nothing more senseless than the auto costume, with the leather cap, goggles, leather knickerbockers, short jacket, tan shoes and golfing stockings. Of course if the driver poses as a jockey then it may do to clothe him in such a garb, but if gentlemen out for a day's pleasure dress as becomes gentlemen, we can see no more reason for dressing as for *opera bouffe* to drive an automobile, than to drive a four-in-hand or a road team.

Driver and Guest	Vehicle	Horsepower	At the start		At 25 miles		At the finish		Time of last 25 miles		
			Position	Time	(Order in elapsed time)	Time	Elapsed time	Position		Time	Elapsed time
A. L. Riker and A. H. Whitney	Riker Elec.	5	1	10:24:00	2	11:24:36	1:00:36	1	12:27:30	2:03:30	1:02:54
S. T. Davis, Jr., and Jos. McDuffee	Locomotive Steam. Auto. Co. of Am.	4	9	10:28:00	1	11:26:13	58:13	2	12:46:27	2:18:27	1:20:14
A. Fischer and mechanic.	Winton Gasoline.	5	4	10:25:30	4	11:32:12	1:06:42	3	12:55:31	2:30:01	1:23:19
David W. Bishop, Jr., and mechanic.	"	6	3	10:25:00	5	11:38:08	1:13:08	4	1:03:08	2:38:08	1:25:00
Albert C. Bostwick and Legence Blanchet.	"	6	2	10:24:30	6	11:41:33	1:17:03	5	1:11:12	2:46:42	1:29:39
G. F. Chamberlin and mechanic.	"	6	7	10:27:00	7	11:45:58	1:18:58	6	1:15:44	2:48:44	1:29:46
†C. J. Field and Kenneth A. Skinner.	DeDion Gasoline.	3	6	10:26:30	8	11:50:28	1:23:58	7	1:39:30*	3:13:00*	1:49:02*
D. Hennen Morris and R. H. S. Abbott.	Locomotive Steam.	4	8	10:27:30	3	11:29:13	1:01:43				
†William H. Hall and mechanic.	"	4	5	10:26:00							

*Unofficial time. †Met with accident. ‡Broke down 18 miles out.

The above tabulated report from the *Motor Age* gives all the statistical details of what will prove an historic contest.

NEW AUTOMOBILE CORPORATIONS.

THE ECLIPSE AUTOMOBILE Co., organized at Portland, Me., with a capital stock of \$50,000, of which \$70 is paid in. Harvey L. Cram, of Portland, is president, and John H. Eldridge, of Taunton, Mass., treasurer.

THE CONRAD MOTOR CARRIAGE Co. will soon be a new industry in Black Rock, N. Y. Automobiles will be manufactured. The works will be located at Bradley and Dewitt streets and will at first simply build carriages, the motors being constructed by the Buffalo Gasoline Motor Co., which has its works in the same building. The new company is capitalized at \$25,000, and the stockholders are: Dr. J. H. Potter, president; Daniel B. Adams, secretary and treasurer; F. P. Conrad, manager, and Mrs. F. P. Conrad and Bella Conrad, directors.

DOVER, DEL.—Another big English concern for the manufacture of automatic carriages was chartered here recently. It is the Anglo-American Motor Co., to buy, sell and otherwise deal in motors and motor vehicles. It is fostered by New York capitalists and has an authorized capital stock of \$750,000. The British Motor Coupé Co., also chartered to-day, will operate on a much larger scale at the outset, and with a capital stock of \$3,000,000. It is also a foreign com-

pany, but is represented by prominent New Yorkers. It was chartered to buy, sell and otherwise deal in motors and motor carriages. Both companies will probably organize in New York soon.

PORTLAND, ME.—At the registry of deeds April 3 was received a certificate of the incorporation of the Eclipse Automobile Co., to manufacture and deal in automobiles and electrical apparatus used in their manufacture. Capitalized at \$50,000. President, Harry L. Cram, of Portland; treasurer, John H. Eldridge, of Taunton, Mass.; directors, John H. Eldridge, of Taunton, Mass., and Harry P. Sweet-sir, Harry L. Cram, A. J. Desmond, of Portland. Certificate approved March 31.

ALBANY, N. Y.—The Compressed Air Co., of New York City, with a capital of \$8,000,000, filed articles of incorporation with the Secretary of State April 9. The company will manufacture compressed air, light, heat and power plants, vehicles, street and railroad cars, engines, motors, etc. The company will begin business with \$15,000. The directors are: Alexander H. Cook, John D. Campbell, William C. Druxbury, Lloyd Collis, Ernest F. Slocum, Francis R. Foraker, John B. Seymour, David J. Gallert, of New York City, and George P. Howard, of South Orange, N. J.

TRENTON, N. J.—Hub Motor Co., with a capital stock of \$1,500,000. The incorporators are: L. B. Dailey, E. J. Dudley and K. K. McLaren.

THE AUTOMOBILE PATENTS EXPLOITATION Co. has been incorporated in New Jersey, with \$250,000 7 per cent. preferred and \$750,000 common stock, the object being the buying, selling, exploiting, financing, marketing, etc., letters patent, etc., concerning automobiles. The incorporators were: H. A. Wisewood, Thomas Russell, Thomas C. Clarke, O. C. Barber and Samuel P. Colt.

THE first company of all Maine incorporators to manufacture automobiles has been organized and the certificate filed at the office of the Secretary of State. The incorporators are all Maine men, and the presumption is that the people of Eden are to manufacture automobiles instead of buckboards for the use of Bar Harbor people. The company is the Boston Automobile Co., organized at Eden, Me., for the purpose of making and selling automobiles, with \$100,000 capital stock, of which \$300 is paid in. The officers are: President, E. Shirley Goddard, of Eden; treasurer, Frank Pinkham, of Eden.

THE AMERICAN STEAM WAGON Co., of New York City; capital, \$2,000; directors: Frederick P. Voorhess, of New York City; Charles J. Dodd, of Brooklyn, and S. C. Green, of Jersey City, N. J.

AUTOMOBILE LITERATURE.

"THE Electric Automobile, Its Construction, Care and Operation," by C. E. Woods, is the title of a work published by Herbert S. Stone & Co. In this work the author has given his readers a volume of much interest, and from which much valuable information can be obtained. He traces the early history of motor vehicles, and their influence upon the times, and follows up with the introduction of electricity as a motive power. His description of the various parts and the general construction of the motor vehicle is such as can readily be understood by the non-expert reader, and will therefore prove specially acceptable to users of electric vehicles. The one mistake is instituting comparisons between the motor vehicle and the horse, and giving tables that go to prove the motor vehicle the cheaper of the two. Comparisons are always odious, and particularly so when instituted between an old and tried method and one that is in its infancy. The motor vehicle must prove its own merits by its works. Antagonizing the horse and giving one-sided testimony won't aid the motor.

The book is well illustrated, both by old and modern styles of motor carriages, and will prove a valuable addition to automobile literature. It is, so far as we know, the first complete work of the kind. The author is an expert, and an enthusiast in the electric line, and he pleases the reader by his earnestness and thoroughly practical treatment of the subject. Price, \$1.25.

AUTOMOBILE BODIES.

THE Frantz Body Manufacturing Co., of Akron, O., manufacturers of fine carriage bodies, are making a specialty of automobile bodies. Those interested should write the company for prices, etc.

CHARLES E. MILLER, manufacturer, jobber and exporter, Reade street, New York City, announces that he gave up the selling agency of the "P-T" motor on April 9.

TRUST TO CONTROL AUTOMOBILES.

THE Anglo-American Rapid Vehicle Co. has been organized at Philadelphia, with the object of gaining control of all the automobile and transportation companies of the country. Philadelphia capitalists are largely interested in the new enterprise, and steps are now being taken to amalgamate the various concerns in one gigantic company or trust. W. W. Gibbs, president of the Pennsylvania Electric Vehicle Co., and who is largely interested in the Autotruck Co., of New York, is president of the Anglo-American Co.

A LARGE CONTRACT TO BE GIVEN OUT.

SPECIAL drawings and specifications are being prepared for fifty auto-cars for street transportation purposes. Contracts will be let shortly for their construction, in parts or as a whole. Information may be had from W. A. Lake, Room 16, Portland Block, Chicago.

NEW AUTOMOBILE COMPANY IN BUFFALO, N. Y.

THE C. R. Thomas Motor Co. will soon commence the manufacture of motor cycles and motor vehicles in Buffalo. A quantity of machinery has been purchased and part of the plant leased from the Globe Cycle Co., on Broadway. Mr. E. R. Thomas is no stranger to the cycle industry. For five years he was managing director for H. A. Lozier & Co.'s Canadian business. He was also second vice-president and is still a director in the Canadian Cycle & Motor Co. Mr. O. F. Thomas will be interested with his brother, and will be remembered as one of the members of the Standard Cycle Co., which located here in the fall of 1899. The Thomas Motor Co. will start business with a capital of about \$150,000.

ITS BANK ACCOUNT.

THE Illinois Electric Vehicle Transportation Co. announces that to date the organization has \$418,355.39 in bank to its credit. This amount is deemed adequate to meet all present and immediate future requirements. By the proposed reduction of the authorized capital stock of this company from \$25,000,000 to \$2,500,000 and of the par value of its stock from \$100 to \$10 per share, the company, in addition to the cash and other assets in hand, will have the right to hereafter call the unpaid \$5 still owing on all of the unpaid subscribed stock. Thus the company will be provided with a large additional fund whenever the development of its business requires that a call be made for all or any part of said second installment.

NEW YORK REPOSITORY.

THE Waverley Automobile Co., of Indianapolis, Ind., have opened a repository at 945 Eighth avenue, New York City. Mr. R. M. Banoise will be in charge. They will carry a full line of pleasure vehicles and delivery wagons.

TWO AUTOMOBILE SHOWS.

NEW YORK is now promised two automobile shows for the fall. The first in point of date is the automobile show given by the Automobile Club of America, at Madison Square Garden, opening November 3 and closing the 10th. The garden has already been leased, and many of the plans fully developed. The main feature, in fact the entire show, will be a series of competitive tests by the owners of automobiles. The main floor will have a track constructed about the outside, and the center will be used for a display of "mobes." As this space will be decidedly limited, only the exhibitors who speak first will be able to obtain space. Bridges over the track will admit the public to the center of the garden. The galleries will be used for spectators, and the boxes will probably be sold, as in the Horse Show. In fact, the whole idea of the show is founded on the scheme of the Horse Show, and will be one of the social events of the fall season.

On November 14 the second automobile show will open. It will last ten days, and will be a representative collection of automobiles and all accessories. Grand Central Palace has been engaged, and over 100,000 square feet of floor space will be devoted to the display.

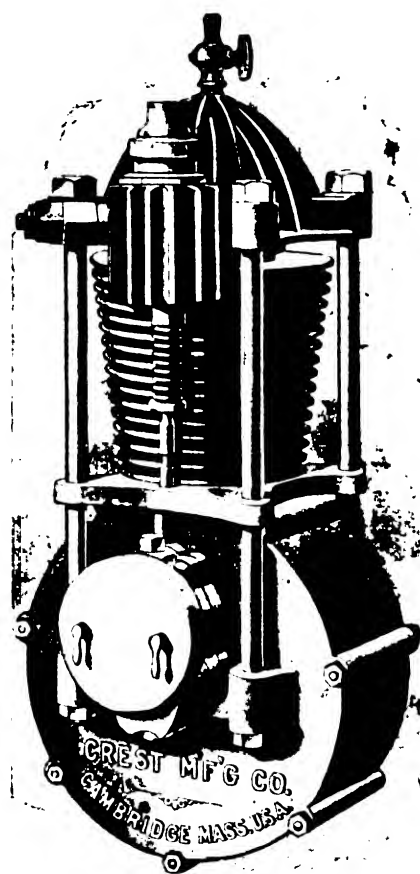
A large part of this space is already disposed of, and everything indicates that it will prove the greatest show of the character that New York has ever had. A space 85 x 120 feet will be devoted to

showing "autos" of all kinds in motion, and abundant space for spectators will be supplied.

Everything points to the success of both shows. As they in no way conflict, each will serve to help the other, and the amount of automobile enthusiasm which will thus be centered in New York will undoubtedly make it the world's center for this industry.

CREST TWO AND ONE-HALF HORSE-POWER GASOLINE MOTOR.

THE Crest Manufacturing Co., of Dorchester, Mass., whose duplex-motor is known among manufacturers of automobiles on account of its extreme light weight per horse-power, reliability and simplicity, are now introducing a new type of the vertical motor which should meet with a good demand among the small carriage manufacturers who have the tools and facilities to build frames



CREST GASOLINE MOTOR.

for tricycles and quadricycles. This motor is very powerful, having a larger diameter of cylinder than any of the American and European types of air-cooled motors. It represents the highest perfection in design and construction, as the shops of the Crest Manufacturing Co. are well equipped with special tools, every part of the motor being made to gauge, all parts being interchangeable. The motor is clean, nearly vibrationless, and the electric ignition and its method of speed regulation make it one of the most satisfactory gasoline motors now in use. The special advantages of this type of motor are in the form of construction; that it does not need attention, being automatic; all working parts enclosed from dust, self-oiling, and speed can be regulated by the sparking device from 200 to 2,000 revolutions per minute. All working parts are easily and cheaply replaced. No adjustment of any kind is needed. Few wearing parts. All wearing surfaces large and the motor is fully guaranteed. It is furnished complete with spark-coil, battery, muffler, carburetter and sparking plug. The cylinder and heads have heat radiating ribs which effectually carry away the heat even under the most extreme service, without the use of water jacket. The head contains the sparking-plug, exhaust and automatic induction valve. The head, cylinder and crank-case are held together by four stay bolts. The crank-case contains two fly-wheels connected to a trunk piston by a connecting rod. The cylinder, piston and rings are ground,

making a perfect fit, which although costly in construction, insures increased power to the motor. All wearing parts are made of hardened tool steel ground in shape, making a durable and serviceable engine adapted for the hardest service. The company are sparing no expense in construction, determined to make the best engine of this type on the market.

THE ASTER MOTOR.

THE Waltham Manufacturing Co., of Waltham, Mass., are the exclusive American agents for the Aster motor, made by the Aster Motor Co., of St. Denis, France, for the company's tandems, tricycles and autogós, also for sale to the general public. The company will open a "motor accessory department" at 424 Massachusetts avenue, Cambridge, Mass., with a complete line of Aster motors, carburetters, batteries, etc., also a complete line of all kinds of motor accessories, for wholesale and retail.

The Aster line will include air cooling motors for tandems, tricycles and autogós, and water cooling for voiturettes, runabouts and light carriages. They will have samples of all kinds of vehicles fitted with the motors, and Albert Champion will be on hand to demonstrate them to prospective purchasers. They will sell the complete vehicles from this department to anyone wishing them, but the important business will be the sale of motors and accessories. They expect to have the department in operation early in May.

La Revue de l'Industrie Nationale says of the Aster motor:

The "Aster" motor is of recent creation; viz., October, 1898; but it has already brilliantly assumed the first place. In the race from Paris to Nantes and back, organized by *La Presse*, it affirmed its undisputed superiority. In this race of 100 kilometers, over somewhat unequal country, and in a drenching rain, Beconnais arrived first on a tricycle, with "avant-train" carrying two persons, in two hours fourteen minutes, beating the best of his competitors by twenty-one minutes. The machine was furnished with the "Aster" motor. The Aster motor has been specially designed for speed and touring tricycles, and also for two-seat quadricycles. The effective power of the Aster motor is $2\frac{1}{4}$ at 2,000 revolutions. It is built by the Aster Co., in their plant, No. 33 Boulevard Carnot, St. Denis, at Paris. The official representative of the *Revue de l'Industrie*, upon due investigation of the motor, states its main particulars to be as follows:

First, the facility of cooling off, due to its radiating flanges of corrugated copper, a metal, the conductivity of which, being superior to that of cast-iron, secures on equal surface a thrice cooling in proportion to the latter. While it being possible with copper to enlarge said surface (that which is not possible with cast-iron) the heat produced by the internal explosions of the motor is in every case completely absorbed, affording the motor constant power and regularity, whether after a few minutes or hours of fast riding, maintaining perfect lubrication; second, another great advantage of the "Aster" is its constancy of carburation. The gas accumulating in a dome surmounting the carburetter, stays there a sufficient time to cause a perfect homogeneous mixture of air and hydrocarbon.

The electric ignition is so disposed as to change the point of combustion, the form of the "cam" assuring a perfect contact and the interruption of the current producing the spark.

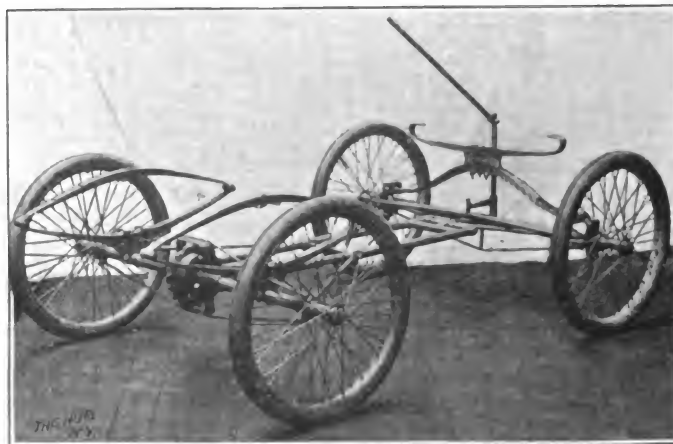
Now as to the most successful achievement of the Aster motor, besides the Paris-Nantes contest, mentioned above, here are the principal records made in 1899 by the "Aster," which constitutes the best proof of its practicability:

Kilometer record—Rigal, 0.57.3-5. Nice-Castellane-Nice, Rigal finished first of the motor cycles without a double motor; 1,000 Kil. course (Nice), Beconnais finished first; Paris to Roubaix (269 k.), Beconnais finished second; Dresde to Berlin (218 k.), Krauss finished first. Race of motorcycles and voiturettes to the Park of Princes (20 Kil.), won by Vasseur in 21 minutes; Beconnais finished second. Pau to Bayonne (104 Kil.), Rigal finished first in 1 hour 58 minutes. Pau-Bayonne-Pau (208 Kil.), Vasseau first, Beconnais second. Motor Cycle Cup of the Automobile Club of France (100 Kil.), Beconnais first in 1 hour 46 minutes. (Record.) Grand race for amateurs U. S. F. S. A. for Cup, Maron to Gardon (100 Kil.), Madec first, Tampier second, Ricard third. Gold Cycle Race at Berlin, Heiman first, Demester second (Motor-Gladiator). One hour race to Park of Princes (in the rain), Beconnais first (57 k. 453), Rigal second. Petroleum tandem race to the Park of Princes, Loste Brother first (tandem Gladiator). London race (20 miles) Wridgway first. Challenge race for motor cycles at Lille, Ricard first.

Bayonne (10 Kil. course), Bertin first. Paris to Brest and return (1,200 Kil.) Record established by Charles Terront in 40 hours 4 minutes.

DIEBEL'S AUTOMOBILE RUNNING GEARS.

THE Diebel-Eppler Manufacturing Co., of Mount Holly, N. J., are now ready to furnish the trade complete running gears for automobiles, of which they make two sizes, Style B, with $\frac{3}{8}$ in. and 1 in. axles, and Style A, with $1\frac{1}{8}$ in. and $1\frac{1}{4}$ in. axles. They also supply the different parts, such as hubs, built up wheels, with or without tires, compensating gears machined and framed with sprockets with $\frac{5}{8}$ in. x $1\frac{1}{2}$ in. pitch chain and ball bearing knuckle joint, steering devices in four sizes with $\frac{3}{8}$ in., 1 in., $1\frac{1}{8}$ in. and $1\frac{1}{4}$ in. axles. These running gears are rigid, and are constructed in the best manner, and are among the most compact, complete and improved run-



ning gears ever offered. They are particularly novel for their swivel movement in center of front axle, for which application for patent has been made. This swivel movement obviates all twist and strain of the frame and adjusts itself to any angle it may be subjected to, even to uneven roads, and is therefore well adapted to place power and power transmission direct on the running gear. Style A gear, as illustrated, is constructed of 1 in. and $1\frac{1}{2}$ in. tubing with $2\frac{1}{2}$ in. pneumatic tires, 28 in. wheels, is capable of carrying a load from 1,200 to 2,000 pounds with safety, and is suitable to receive mostly any kind of one or two seat carriage body, or light delivery body, complete, as shown, with tires. Style B is considerably heavier all around, and is capable of carrying loads to 3,500 pounds, for heavy vehicles and business delivery. These gears will be furnished with any desired wheel base and width of track required, and for any motive power in existence. The Diebel-Eppler Manufacturing Co. have also under construction complete automobiles.

ANOTHER NEW AUTOMOBILE.

THE latest idea in automobiles is being worked up by Mr. W. E. Oswald, foreman of the Kalamazoo Wagon Co., of Kalamazoo, Mich. The style of body is that of a stick seat canopy top surrey. The gear, however, instead of following the plans of other builders, is constructed so as to be propelled by all four wheels. His theory is that when driven by the rear wheels the tendency is to cause the front wheels to plow into the ground, and if driven by the forward wheels the rear wheels will drag, all of which will be overcome if driven by all four wheels. His experience is that by such an application of propulsion 30 per cent. power can be saved. Mr. Oswald has applied for a patent for his front axle, which he constructs with a large ball in the center, with differential gear inside, and a second, or exterior shell, on the outside, upon which is fastened the sprocket, also a device for holding the sprocket chain, from the countershaft, or controlling device, so that the front axle can turn at any angle without throwing the chain out of line. He believes that an automobile driven by all four wheels is better adapted to the rough roads and hills of Michigan than any other. His automobile will be propelled by a four cylinder $4\frac{1}{2}$ horse-power gasoline motor, manufactured by the Buffalo Motor Co. Its speed will be from one to fifteen miles an hour. At the speed of four miles per hour he believes his machine can climb a hill of two inches to the foot grade. Mr. Oswald hopes to have a perfected motor ready for service in about two months.

AUTOMOBILE STATIONS AT JERSEY COAST SUMMER RESORTS.

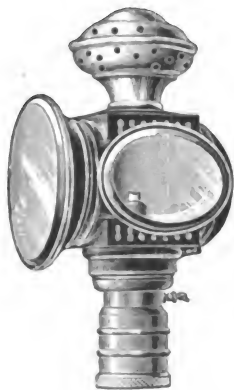
THE New Jersey Electric Vehicle Transportation Co. has arranged to install automobile stations during the coming season at the following points on the Jersey coast: Seabright, West End (Long Branch), Allenhurst, Spring Lake and Atlantic City. At each of these stations Columbia vehicles, both electric and gasoline, of various designs will be for sale, and a specialty will be made of charging and caring for Columbia automobiles owned by private parties. The location of the various stations insures proper accommodations for vehicles and offers a large field for driving. Park wagonettes and omnibuses will be available for special service, and for parties wishing to make trips through the surrounding country. The company has opened a salesroom at 541 Fifth avenue, New York City, where all types of Columbia automobiles are exhibited, and where information regarding prices, etc., can be obtained, and where, upon application, full information will be furnished.

FOR STEAM ROAD WAGONS.

THE Kitts Manufacturing Co., Oswego, N. Y., have received several large orders for their steam specialties from a steam road wagon concern of Paducah, Ky., and will within a few days keep the shop running until 10 o'clock each night. A larger force of men and new machines will be necessary to carry on the work.

ACETYLENE GAS LAMPS.

THE Frank E. Bundy Lamp & Sundry Co., of Elmira, N. Y., with offices at Nos. 7 and 9 Warren street, New York, have started out with the intention of catering to every class of trade using acetylene gas lamps, as they have lately been appealed to by numbers of carriage manufacturers and automobile makers to get up something for them, in the shape of a lamp, that would be attractive as well as useful, to take the place of the many very showy articles in the way of carriage lamps which look very well in the daytime, but in too



many cases are practically useless at night. The Bundy Co. have therefore given a great deal of thought and attention to producing a lamp that would not only be very attractive, but would be useful as well, and after patient effort on their part they have succeeded in producing a line of lamps which they are satisfied will meet the demands of all classes of drivers. Their lamps are not only beautifully finished, but they will give five and one-half hours' light with one charge and a light that is just as brilliant when the vehicle is still as when in motion. They are perfectly odorless and always clean, and we can recommend them to the most fastidious. Drivers as well as riders like them. Try a pair and be convinced.

A SIXTY-MILE RUN.

F. S. PUSEY, president of the General Electric Automobile Co., recently made the trip from Philadelphia to Atlantic City in an electric automobile with one set of batteries and on but one charge of the same. The special point claimed for this run of sixty miles is that a regular commercial battery, made for practical every-day service, was used instead of a "short-lived" battery made for an unusually long or special run.

Wearry Walker—"Dese automobiles are gettin' mighty common."

Dusty Rhodes—"Yep, it'll soon be safe fer us fellers ter say we're hostlers lookin' fer work."

NORTHERN OHIO BLANKET MILLS.

THE Beckman Co., owners of the Northern Ohio Blanket Mills, Cleveland, O., have just completed a new addition to their mill, 80 x 180 feet, three stories, and have added to the machinery three sets of 60-inch cards, and twenty of the latest Crompton & Knowles blanket looms, making 110 in all; spinning mules and other late improved machinery to balance up the cards, at a cost of \$75,000, all told, and now have by far the finest blanket mill in the country, and very much the largest mill confined as a specialty to wool horse blankets. It is now "At" in the latest and best machinery, and able to turn out 2,000 wool blankets per day. They announce that trade is up to last year, and considering the poor blanket winter just passed, this is comparatively a large increase of business.

CATALOGUES RECEIVED

COLFAX MANUFACTURING Co., South Bend, Ind., manufacturers of carts and carriages for ponies, cobs, etc., have issued their catalogue for 1900. It is a pamphlet of forty-eight pages, illustrated on each page in most cases with pony vehicle and show pony, showing a long line of popular vehicles, fashioned after those of full size. Send for a copy.

The George Delker Co.'s, Henderson, Ky., catalogue for 1900 is a neatly printed pamphlet in two colors, showing a variety of the leading classes of vehicles built by this firm, consisting of buggies, phaetons, surreys, with canopy and extension tops, and light wagons. The cover is in imitation of bas-relief.

John Deere Plow Co., dealers in carriages, Kansas City and Denver, have issued a very large and complete catalogue containing nearly 100 illustrations of vehicles, from the common road cart to the extension top surrey and phaeton, accompanied by full descriptions and list prices. It is well printed upon fine paper, and is a valuable addition to the list of carriage catalogues.

The twenty-second annual catalogue of the Enterprise Carriage Manufacturing Co., Miamisburg, O., is one of the neatest that has reached our office. It contains a representative list of illustrations of vehicles built by this company, including buggies, top and no top, phaetons, surreys, canopy and extension top, jump seat buggies, etc., neatly printed in colors on fine paper, with a brown, black and gold cover. A half tone road coach and four forms the central picture.

Mansur & Tebbetts Carriage Manufacturing Co., St. Louis, Mo., makers of "White Elephant Vehicles," have put out the largest catalogue that has reached our office this spring. It is profusely illustrated with vehicles of all kinds, from the buggy to the extension top phaeton, spring wagons, depot wagons, carts, etc., also harness, buggy, surrey, farm, etc. The cover is printed in colors and gold, embossed.

Osgood Morrill, Amesbury, Mass., has issued a catalogue of his specialties for 1900, showing neat designs of buggies, pneumatics, stanhopers, surreys and traps, also some of his patented specialties, axles, fifth wheels, etc. Send for a copy.

Sullivan Bros., Rochester, N. Y., manufacturers of carriages and cutters, have forwarded us one of their 1900 catalogues, showing their lines of pneumatics, buggies, surreys, top and no top. The designs merit special attention.

The Searles Manufacturing Co., Newark, N. J., manufacturers of whip sockets, dash rails, screen dash and other sleigh rails, carriage goods, such as shaft tips, pole crabs, whiffletree tips, hub hands, washers, name plates and other finishing goods, have issued their catalogue No. 17, a large and complete work, carefully compiled and neatly printed, a valuable assistant to the buyer of carriage mountings.

Stow Manufacturing Co., Binghamton, N. Y., manufacturers of the Stow flexible shaft, have forwarded us one of their catalogues for 1900, containing illustrations and descriptions of the Stow portable shaft; also drills and other tools operated by it. In addition, they show their multi-speed electric motor and combined flexible shaft, also a stationary multi-speed motor, illustrating method of speed regulation. The multi-speed motors should secure special attention from all interested in electric motors, and we recommend that such especially write to the company for a copy.

The Muncie Wheel Co., Muncie, Ind., has evidently been struck by the muses and tells in verse and pencil the merits of the Muncie wheel. The work has the merit of novelty. Send for a copy.

Buffalo Gasoline Motor Co., of Buffalo, N. Y., manufacturers of motors for vehicles, boats and stationary purposes, send us an illus-

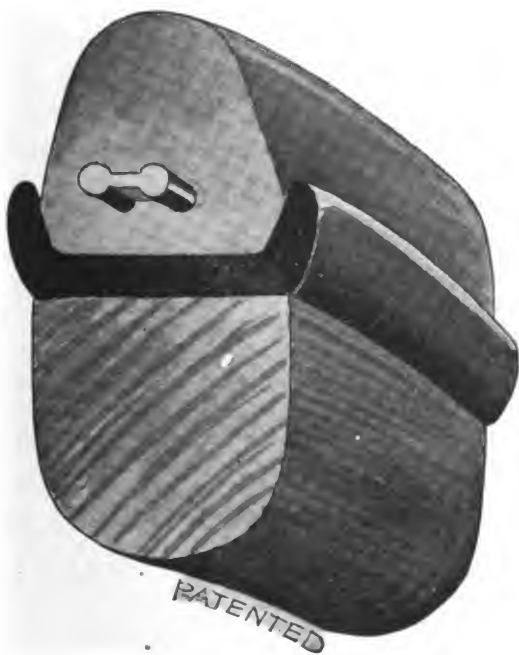
trated catalogue of their products, consisting of motors, transmitters, equalizing gear, steering devices, and their standard gear, which is furnished complete for the vehicle builder. Those desiring to build motor vehicles should communicate with this company.

Riker electric vehicles are well illustrated in the new catalogue issued by the Riker Electric Vehicle Co., of Elizabethport, N. J., which not only shows a number of vehicles complete, but also parts and appliances, all fully described.

Waverley electric vehicles, built by the American Bicycle Co., Indianapolis, Ind., are well illustrated and described in a catalogue issued by the company. The styles illustrated are attractive, and in a good variety. Capacity and prices are also given. The company call special attention to the Willard automobile storage battery, used by them.

CALUMET TIRE RUBBER CO.

THE Calumet Tire Rubber Co., of Chicago, Ill., have brought out a new retaining band, which allows no lateral or radial cutting from



the inside of the tire. These are attached by a special machine, in one-half the usual time, the fastening device being more efficient than brazing or welding.

CARRIAGE MAKERS' CLUB.

THE executive and arrangement committees of the Cincinnati Carriage Makers' Club met at the Grand on April 25 and decided to have the annual outing about the middle of June, the exact date to be determined later, after consulting the calendar for a moonlight Saturday night. It will be an up-the-river boat excursion, and a supper in the grove opposite Miamishburg. The boat will leave Cincinnati at noon.

NEW CARRIAGE TIRE.

RICHARD MULHOLLAND, the carriage manufacturer of Dunkirk, N. Y., has been granted a patent on a device for fastening rubber tires to vehicle wheels. Mr. Mulholland's new method consists of a hollow T-shaped spring steel locking device, onto which a corresponding groove in the rubber allows the tire to be slipped. The locking device runs longitudinally around a flanged metal felloe fastened to the rim of the wheel. Steel bolts are then placed at points along the felloe, and on the interior of the felloe are the nuts. The heads of the bolts fit into the locking device, and by tightening the bolts, steel holder and tire are brought tightly against the felloe, thus insuring against all creeping and wearing on the edge of the rubber. The fact that the new device is hollow causes it to act as an air cushion, and thus adds greatly to the resiliency of the tire.

ADVOCATES WIDE TIRE LAWS.

FLORENCE, MASS., April 2, 1900.

To the Editor of THE HUB:

DEAR SIR—With the increasing interest in good roads which has been aroused within the last few years has come the enactment in a few of our States of the "Wide Tire Laws." That the use of wide tires is not only a preventive of injury to roads, but actually serves to make the roads better, no one will dispute. All users and makers of vehicles are, or should be, interested in the betterment of our roads, and if the manufacturers would only realize it, they possess a great influence toward this end.

The enactment of so many wide tire laws shows that soon the manufacturers will be compelled to equip all heavy vehicles sold in certain States with much wider tires than those now used. If the makers could all agree on a standard width, which would satisfy the existing laws, and would furnish all wagons with these standard widths, the necessity for the enactment of further laws would be removed, there would be a general uniformity in all the States, and at once would all sections of the country be benefited by the introduction of wagons which are road makers instead of road destroyers.

Every one of these wagons would also be a great educator, and it would take but a short time for all classes of vehicle users to appreciate the great value of wide tires for every kind of vehicle. Wide tires mean better roads. Better roads mean an increased working life for the horses, a greatly increased and a much more speedy traffic, increased land values, and a direct gain to the whole country. Cannot THE HUB bring this matter to the attention of the manufacturers in some practical way? If even one or two large manufacturers should begin and equip all their vehicles with wheels of wider tread, it would be only a short time before the others would of necessity follow suit. The public are already demanding wide tires, and they are bound to come.

Very truly yours,
HARRY K. BURR.

A MISTAKE THAT SOME CARRIAGE BUILDERS MAKE.

Editor of THE HUB,

DEAR SIR—Some carriage men seem to think that if they can get off an old style job on a farmer or anyone who knows nothing of new styles, that it is so much money made, but it is a sad mistake.

Your work is the best advertisement you can have, and people who will not have these old styles and see a manufacturer who is carrying those that are ten years behind the times, will go somewhere else to buy, and besides this they are very likely to tell others to do likewise.

I once knew a case of this kind. A carriage firm with whom I was working sold an old style four passenger surrey to a farmer named Brown. A few days after he bought the job I went to another town about twenty-five miles distant, and a man who had just built a new livery stable told me he wanted to buy a dozen jobs. Well, of course I insisted on his buying them from the firm I was working for, and he asked me where Mr. Brown's job was built, and I told him. He said he would go somewhere else to buy, and he did. Thus you see they lost a great deal more than they gained by so doing.

Old style bodies ought to be kept in the shop or burned.

R.

SEVENTY FIRMS.

THE American Vehicle Wood Stock Association, Mr. B. F. Von Behren, of Evansville, Ind., president, and Mr. J. E. Baselor, secretary-treasurer, met in Cincinnati, O., on April 5, the second meeting of the organization, which purposes taking in the 160 companies of the United States operating in woodwork that goes into the manufacture of vehicles. There were sixty firms represented at the first meeting. At the last meeting ten other companies were added to the association. The object of the meeting was to classify and arrange a uniform price list and discounts. These companies work only in oak and hickory woods.

INCORPORATED.

THE Boston Wood Rim Co., Limited, of Toronto, has been incorporated with a share capital of \$50,000. The provisional directors are: C. H. Hurndall, Walter Seldon and George Edwards, of Toronto.

THE "AUSTRALIAN COACHBUILDER AND SADDLER."

THE March issue of our Australian contemporary comes to us as an anniversary number. In addition to its usual technical and general news matter it contains an interesting history of its founding and struggles for the first ten years of its life, made specially interesting by portraits of its founder, Mr. Justin; Charles Mac Curtie, his successor; Mr. J. E. Bishop, editor and principal proprietor, and Messrs. John, Thomas and Albert Butler, associate proprietors, together with those of ten other gentlemen who, as representatives or contributors, shared in the labor of carrying the journal through its first decade. Those readers who are prone to look upon the labor of a trade journalist as a pleasant pastime will learn a little of the toil, disappointments and obstacles common to those who enter the journalistic field.

THE HUB congratulates its far away co-worker on its evidences of prosperity, and expresses the hope that, having won a right to demand recognition from the industry that it has so faithfully served, the future will be freed from the antagonisms, or what is more discouraging, the cold indifference of the men who are benefited by a literary and art exponent, and we also congratulate the Australian vehicular industry on having so enthusiastic and able a representative and advocate, one that deserves support as a technical instructor, a news compiler and an advertising medium, and hope that the industry will aim to make its second ten years as replete with prosperous hours as the first were with those of toil and hope.

SCHRACK'S VARNISH.

SCHRACK'S varnish has long been a standard for high grade goods. You can always get reliable stock from this old house, and can depend upon its uniformity. Few houses have enjoyed so long a period of business prosperity, or have retained so unbroken a line of customers. Entering the twentieth century with an enviable reputation for excellence, we may reasonably expect that they will obtain a goodly share of the prosperity that bids fair to be meted out to American manufacturers. Address C. Schrack & Co., Philadelphia, Pa.

CARRIAGE MAKERS' EASTER BALL.

THE Carriage Makers' Relief Association, of Watertown, N. Y., held its "first annual" in the form of an Easter ball on April 17. It was a success. Over 300 persons were present, the hall being filled to its full capacity. This association was organized a year ago in Music Hall. It is composed of employees of the H. H. Babcock Co. The dues are \$3 per year. A weekly sick benefit of \$5 is paid, and there is a death benefit of \$50. There are now nearly 200 members, and the experiment is proving a success. The officers are: J. H. Hyde, president; J. O. Sweeney, vice-president; Thomas Goodwin, secretary; Charles Poor, treasurer. The directors are: P. Doran, J. Donley, F. Horton, Charles Risley and O. Valier. The officers and directors acted as floor managers, etc.

DO YOU WANT A DRINKING CUP?

THE Standard Wheel Co., of Terre Haute, Ind., have written to all carriage and wagon manufacturers, the accessory trades, and all retail jobbers, asking for the names and addresses of all their traveling salesmen. They will send each one of the nicest little hand cut drinking glasses ever seen, together with a durable leather case that just fits it. Their new catalogue, which is a very handsome one, is out, and shows illustrations of a new hub that is really an innovation in wheel manufacturing. If you haven't received one, send to them for it.

DATE CHANGED.

At a very large gathering of the carriage manufacturers, held in Cincinnati on April 5, conferring with the executive committee of the Tri-State Vehicle and Implement Dealers' Association, after quite a conference it was decided to change the date of the convention to the week of November 19, 1900, and there will be an exhibit of vehicles, harness and implements, under the auspices of this association, given at Music Hall the same week. The committee was given quite a nice little banquet and a trolley ride in the afternoon.

NOT CONNECTED WITH THE CRESCENT AUTOMOBILE MANUFACTURING CO.

NEW YORK, April 24, 1900.

Editor of THE HUB:

DEAR SIR—I have just learned that my name has appeared in some of the automobile publications as being interested in the Crescent Automobile Manufacturing Co. As this is incorrect, it is my desire to have a correction published. I am not connected with the company, either as an investor, nor in any other way, shape or manner. It is true that I had negotiations with the president of the company, with the idea of taking up the sale of their line, but these negotiations were not consummated.

Yours truly,
H. C. DOUGLAS,
Of Douglas & Co.

FIRE WON'T INTERFERE WITH FILLING ORDERS.

SHORTSVILLE, N. Y., April 16, 1900.

Editor of THE HUB, New York City.

DEAR SIR—Please say to the readers of THE HUB that our recent fire consumed our rough stock plant, which, fortunately, was about sixty rods away from our wheel plant. The stock lost was mostly green timber, which we were preparing for another season's business. We have, however, plenty of dry stock, and the fire will not interfere in the least with filling all orders for wheels which we have on our books, and all that may come to us from now on.

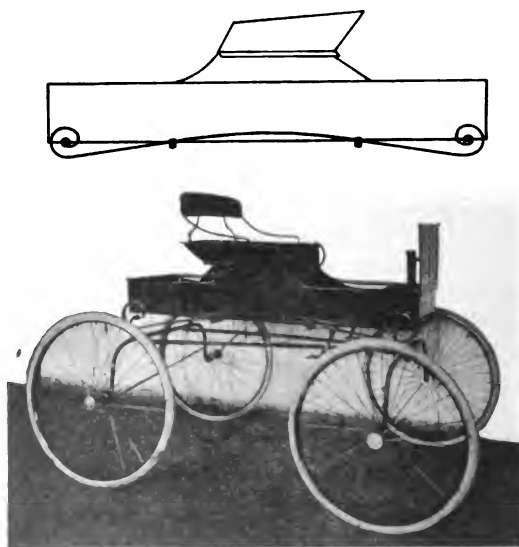
Yours truly,
SHORTSVILLE WHEEL CO.

A GOOD REPORT.

THE Welding Compound Co., of Paterson, N. J., reports that the sales of compound for the month of March were the largest in the history of the business for the same period, and that sales since January 1 are largely in excess of those of 1899, which was the "banner" year. To give an idea of the growth of the business they state the following fact: Although the compound was introduced in 1874, Mr. Mitchell, now president of the company, did not become interested in the business until 1880. The sales on one day in March just past were nearly equal to sales for entire month of March, 1881.

A NEW SINGLE LEAF SPRING.

THE Dubois single leaf side spring is one of the latest developments in the way of carriage springs. Its construction does away



with the combination of cross springs and side bars, and insures easy riding. It is light, soft in its action, and steady and regular in its motion. It has been thoroughly tested, and has given perfect satisfaction.

THE man who spends his money pushing ideas rather than the results they produce for him, will be apt to find his "bank account" on the wrong side of the ledger.

HIS EIGHTY-EIGHTH ANNIVERSARY.

WE have received from Loring Coes & Co., Inc., a recent portrait of Mr. Loring Coes, president of that corporation, as a souvenir of his eighty-eighth anniversary, April 22, 1900. This portrait, which is an exceptionally good one, is being sent to the many patrons of the company. THE HUB extends congratulations to Mr. Coes, with wishes that good health and many more years may be vouchsafed him.

WEDDING BELLS.

CHARLES AUSTIN LANCASTER, of the firm of J. A. Lancaster & Son, Merrimac, Mass., was united in marriage to Miss Alice Pearl Chapin, of New York City, on April 4, at the home of the bride's parents. The happy couple departed on a wedding trip through the South and will return to Merrimac about May 1. THE HUB sends congratulations.

THE "PNEU-SOLID" TIRE.

A NEW tire for vehicles and automobiles, with entirely original methods of attachment and operation, is something recently patented and fully perfected and largely developed by Harrison C. Frost, of Boston. Mr. Frost has been all his life in the manufacturing rubber

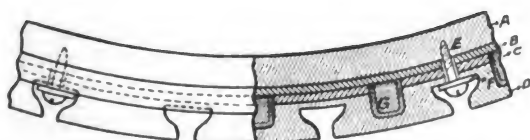


Fig. 1.

business, and invented this tire to avoid certain known troubles in the making and well-known defects and weaknesses in the operation of solid and pneumatic tires. The tire is called the "Pneu-Solid," because it rides with the ease and action of a pneumatic tire without the rocking and rolling effect. It has the indestructible features of the solid tires, but it avoids that trembling sensation that has made them somewhat objectionable, and it will not cut or scalp. The Frost tire is a sectional and separated tread, and unlike other



Fig. 2.

forms. The utility is of particular moment, as the tires can be placed in the same channel iron as used by the ordinary solid tires and can be interchanged. They throw no mud or stones, the accompanying cut showing the way the treads give when under pressure—clearing the way by a sort of snow plow idea. In soft mud or water each projecting end serves as a dasher for the other tread. The treads cannot be torn off, because they are one and part of the whole thing. The rubber is so mixed that while the tread portion



is curing to its normal density the base part has become a semi-hard consistency, giving the necessary rigidity to the strip. The tire is also patented in fifteen foreign countries, including Canada and the American colonies. The rougher the country and the less developed the roads the more valuable is this tire. It should be particularly valuable to any factory desiring to add a line of rubber tires to their products. It is made in short lengths, and can thus be cured in most of the regular presses, and sold by the pound like valves or other molded goods and without preliminary expenses. If durability, ease of riding and simplicity of repair are the things to be desired, the Frost tire must be considered an assured success. Mr. Frost would like to get into communication with agents to push the sale and give exclusive territory.

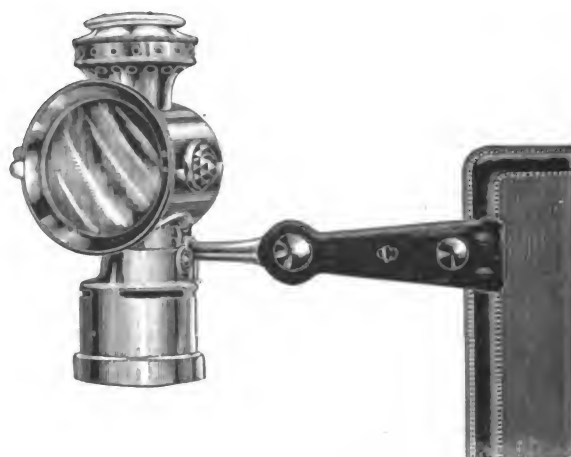
APPOINTED A PRESIDENTIAL ELECTOR.

THOMAS P. EGAN, president of J. A. Fay & Egan Co., wood-working machinery manufacturers, of Cincinnati, O., was recently nominated for Presidential Elector from the Second Congressional District of Ohio. Mr. Egan is in no sense a politician, and his selection is therefore a tribute to his high standing in the community

and among the large manufacturers of the country. Mr. Egan will go to Paris in June to visit the Exposition, where his firm is making a large exhibit. He will return in time for the election.

THE NEVEROUT PATENT LAMP.

THIS lamp is manufactured by the Rose Manufacturing Co., whose main offices are at 910 Arch street, Philadelphia, and has many novel and unique features worthy of special mention, among which is a patent insulated kerosene reservoir, which is a most ingenious device, as it renders it utterly impossible for oil to get on the hands and clothing. This reservoir is so constructed that explosion is positively out of the question, and it cannot be lost. The



patent German silver glass covered reflector can be removed and replaced in a twinkling, and it never loses its brilliancy, and throws a powerful light ahead through a double convex lens. The patent automatic wick lock is a simple but novel device. It renders the wick wholly jar proof, whether riding over the roughest country road or the most evenly cobble paved street. The simplicity and the ease in taking the "Neverout" apart for cleaning are features not to be overlooked. The "Neverout" is made especially for carriages and automobiles, and can be instantly attached to, or detached from, these vehicles. It is often impossible to secure the especially prepared flame foods that so many lamps require to give the proper light. It's a nuisance to be compelled to ride in darkness just because your lamp won't burn kerosene. This is where the "Neverout" has an advantage. It burns kerosene, commonly called headlight or coal oil, which you can get anywhere. The "Neverout" is patented in the United States and all the principal countries of the world, and the flattering testimonials which the manufacturers daily receive from pleased users of this lamp from all countries are gratifying in the extreme. The simple fact that the manufacturers guarantee the "Neverout" to positively stay lit or refund the money, is evidence enough that they have absolute confidence in their assertions.

RECEIVER APPOINTED.

THE Hull & Hoyt Co., dealers in carriage supplies, Danbury, Conn., announce to their creditors that owing to the death of Mr. E. E. Young and the determination of his legal representatives to withdraw his interest from the business, and to a combination of other unfavorable circumstances, which were entirely unforeseen and unexpected, they have found themselves obliged, for the protection both of their creditors and stockholders, to ask the court to appoint a receiver to wind up and liquidate the affairs of the corporation. Upon application, the court appointed and confirmed as such receiver Mr. Henry Bernd, of Danbury. Mr. Bernd is one of the most prominent citizens of Danbury, a successful business man, and a gentleman of the highest integrity and character. Under his administration there can be no doubt that the affairs of the company will be handled judiciously and to the entire satisfaction of creditors. An inventory is now being taken, and the receiver will send out a statement showing the assets and liabilities, as soon as same can be prepared. As the assets largely exceed the liabilities, creditors need anticipate nothing worse than delay in settlement of their indebtedness. As soon as the receiver obtains certain necessary orders of court he will notify creditors as to presentation of claims. The court has ordered that the business be liquidated as "a going concern."

A NEW CARRIAGE REPOSITORY IN DETROIT.

THE Anderson Carriage Co., of Detroit, Mich., will open on May 1, a down town salesroom, on the corner of Jefferson avenue and Randolph street. The room is 200 x 40 feet, with splendid light, and is located so near the center of the down town district that customers may pay frequent visits without inconvenience. The Anderson Carriage Co. is one of the largest and most successful manufacturing institutions in Detroit. Its trade extends all over the United States, and is particularly flourishing in the South and West. The company's catalogue contains over eighty styles of vehicles, and shows some of the nattiest jobs that are on the market this year. They invite you to make their repository your headquarters when visiting Detroit.

ELECTRIC LAMPS.

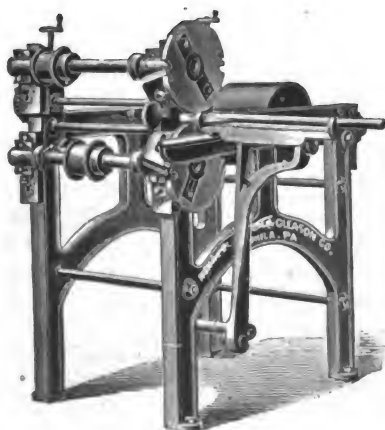
THE Ohio Electric Lamp Works, of Cleveland, O., produce an electric lamp for carriages and automobiles that is efficient and economical, and convenient to operate. Eight or ten improved dry cells are arranged in a neat case, in series-multiple, so as to obtain long life, and no charging or other attention is required. The out-



fits are furnished ready for use, and can be attached to any carriage in one minute. The light can be turned on and off at will. The reflector, a true parabola, magnifies eight times the three-candle lamp, causing it to throw its rays 200 feet. The lamp is six times the efficiency of ordinary incandescent lamps. A complete outfit consists of lamp, reflector, combination bracket for attaching to carriage, conductor cord, connectors and eight-cell dry battery in neat case, ready for use. See the company's advertisement for prices and additional information.

SPOKE TENONING MACHINE.

THE illustration herewith represents John Gleason's patent spoke tenoning machine, which has a world-wide reputation as giving universal satisfaction for cutting tenons on carriage and wagon spokes. It is built for all sizes and classes of work in this line, and cuts both sides of the tenon in one operation. All cutter heads and pulleys are perfectly balanced, and finished with heavy bearings so



as to insure absence of vibration. The cutter heads are adjusted centrally with the spoke and to and from each other for thickness of tenon by a very desirable method while the machine is running. The cutter heads are furnished with shear cutting knives and saws to form the shoulder of the tenon. The countershaft is 1 9-16 in. diameter, fitted with tight and loose pulleys 7 in. diameter by 4 in. face, which should make 700 rotations per minute, this giving the cutter heads 2,100 revolutions per minute. This machine is made entirely of iron, and weighs 600 lbs. It is manufactured by the Gleason Spoke Lathe & Machinery Co., Philadelphia, Pa.

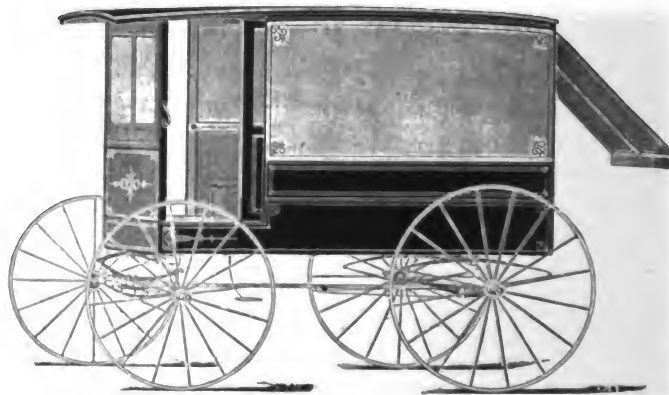
MR. FIRESTONE ADDRESSES PROF. CLARK'S CLASS.

PROFESSOR CLARK, of the State University, and his class in economics, visited the works of the Columbus Buggy Co. on Saturday, April 16. The visit was of great interest and profit to all. Clinton D. Firestone, president and manager of the colossal institution, received the visitors, and delivered a lecture to them on "Business Methods and Advertising." The experience in the business world which Mr. Firestone has encountered made him unusually well equipped to discuss the subject, and the students received the benefit. Many thoughts of value, which are not found in the text books, were presented by the speaker, and progressive ideas were advanced which the students can develop as they progress in their work to the fullness of accomplished work. Indeed, the lecture was a revelation to the students in all the lines followed by Mr. Firestone, and when he had concluded all felt that their visit had been very profitable.

At the conclusion of his address Mr. Firestone personally conducted the class through the works, beginning from where the lumber and the iron are received in the rough, taking the class through all the departments, and concluding with the finished buggies and carriages awaiting shipment. The class was profuse in its thanks to Mr. Firestone for his kindness.—*Ohio State Journal*.

HOOVER WAGON CO.

THE Hoover Wagon Co., of York, Pa., was chartered November last, under the laws of the State of Pennsylvania, with a capital stock of \$100,000. They equipped and started work in their new factory January 1, 1900. Since that time they have been diligently organizing their large force of employees, and securing the most desirable and efficient men that could be obtained, for foremen of their various departments. They are now well equipped, and are prepared to turn out work rapidly and well. They have been favored with a large share of this season's business from all parts of

**RETAIL BUTCHER WAGON.**

the country, in addition to some foreign trade. They endeavor to give their customers good work and complete satisfaction in every particular, and any new trade once secured they never fail to hold.

We show herewith a cut of their retail butchers' wagon, which is somewhat new. It is a very light, neat wagon for the business, and their order book shows that it is a very good seller.

AN ENTERPRISING COMPANY.

THE Owosso Carriage Co., of Owosso, Mich., are making rapid steps forward. They are now classified among the foremost manufacturers of vehicles in the West. Their business has increased to such large proportions that they were obliged to add about 75,000 feet of floor space to their plant last fall, which makes it one of the most complete in the country. The working and other facilities are of the best. They make no claim of building the lowest priced vehicle on the market, but do claim to produce the best medium and high grade work that is on the market for the money.

They have a faculty of incorporating elegant style with good material and good workmanship that makes their jobs sell readily in the repository of every dealer who handles them. Their trade mark is the Buffalo Head. If you haven't their catalogue send for it.

ONE beauty about the automobile is that when it "dies" in the street, it does not have to wait on the leisure of the dead-animal contractor.

ONE TOO MANY.

OUR attention has been called to the following circular, issued by a firm of advertising solicitors doing business in Washington, D. C.:

WASHINGTON, D. C., March 20, 1900.

GENTLEMEN.—We send you a copy of the *Monthly Bulletin*, published by the Bureau of American Republics, which has a circulation of 20,000 a month, that is distributed in the nineteen American Republics.

It is the only publication printed by the United States government in which advertisements appear.

As an advertising medium for firms desiring to reach the export trade it has no equal.

We will allow you an extra discount on all contracts obtained for us.

Write for advertising rates and discount allowed advertising agencies.

We confess that we read the foregoing with considerable surprise. We do not refer to the exaggerated statement of the circulation of the *Bulletin*—which, according to the last annual report of the director, was only 9,000 outside of the United States instead of 20,000—but to the change of policy regarding advertisements. Not only is the policy thus indicated one that has been emphatically discredited by the past unfortunate experiences of the bureau, but it has been formally repudiated by the present director no longer ago than his last annual report, dated November 23, 1899. In this he said:

My predecessors have frequently expressed the belief that the cost of the *Bulletin* could be met by the possible receipts from advertising. I cannot think that this hope can be realized. Under the policy now pursued by the bureau, upon instructions from your committee, and which met with my hearty approval, the receipts from this source cannot be counted on for more than \$3,000 to \$4,000 a year, for it is, I am credibly informed, a well established fact that advertisements are only given when solicited, a method of obtaining them properly prohibited by this office. In course of time the amounts derivable therefrom may become larger, but for the time being no considerable increase can be expected.

The italics in the extract we have given are our own, but the expression of approval of the policy of no longer soliciting advertisements is sufficiently emphatic without them. The change indicated by the circular from the advertising solicitors is still more remarkable in that it is made in direct disregard of an experience with exactly such a scheme as this that would seem to have been sufficiently unpleasant and disastrous to have rendered further experiment along that particular line quite superfluous.

The Bureau of American Republics was established on the 20th of March, 1890, and for several years its official organ, the *Monthly Bulletin*, appeared regularly without attracting the slightest attention either among the "American Republics" or anywhere else. It was printed in four languages, but this luxury of linguistic accomplishments did not save it from being about the driest and most useless compilation of reading matter ever printed at the expense of the United States government—which is saying a good deal. Almost from the start there was trouble with the financial end of the bureau. Theoretically, half of the expense was to be borne by the United States and half by the other associated republics, each paying a trifling sum, varying from less than a hundred dollars in some cases, to two or three thousand in others. Gradually the different South and Central American States failed to send in their quotas, until after three or four years this score of revenue yielded less than a third of what was originally contemplated. The American Congress was prevailed upon to make good the deficits that arose, but the directors finally hit upon the scheme of selling advertising space in the *Bulletin* as a happy solution of their difficulties. The new policy was established June 4, 1896, but the business dragged until the appointment, in 1897, of Joseph P. Smith as director. He immediately inaugurated a most active and aggressive business policy. Advertisements were solicited for the *Bulletin* in all parts of the country by agents sent out from an office in New York. The results were two-fold. The effect upon the finances of the bureau is best stated in the words of the director who succeeded upon the death of Mr. Smith:

I found the affairs of the bureau when I took charge of it in a somewhat disordered condition, owing to the long illness of the late director. The finances were also in an unsatisfactory condition, as the result of a contract entered into by authority of the executive committee, under the late director's predecessor, in November, 1896. The contract provided that the solicitor for advertising should receive a commission of 40 per cent. upon the face value of the advertising obtained. As a basis for the successful prosecution of these efforts, an edition of the *Bulletin* had for some months been printed at a cost of over \$9,000 per month, or \$108,000 per year. The annual

gross income from advertising was estimated at \$60,000, but from this amount 40 per cent. commission was to be deducted, leaving a net revenue of \$36,000.

Inasmuch as it had been the practice to pay the commissions immediately, and it was necessary to wait for reimbursement until the bills for advertising could be collected, it was obvious, that even if the prospective revenue were likely to be sufficient, considerable capital would be required to meet the immediate outlay. The annual appropriation of the bureau was but \$28,000, and the enlargement of its work had necessitated the employment of a number of persons in addition to the previous force. A deficiency appropriation of \$41,972 was voted by the Congress of the United States in January, 1898. The bureau was in arrears at this time for payment of salaries and a number of claims growing out of its business operations, as well as increased work of compilation and translation, typewriting, etc., for various publications. It was evident that the balance remaining from the deficiency appropriation would not more than suffice for these purposes and the efficient prosecution of the work in progress.

Under these circumstances, I suggested to the executive committee that it would be advisable to terminate the contract for soliciting advertisements upon commission.

While one result of this policy was thus financial disaster, so serious that had it not been for the aid obtained from Congress the bureau would have been bankrupt and forced to suspend operations, the other was not less grave. The idea of competition on the part of an institution supported in large measure by the government of the United States with the private interests engaged in the publishing business, awakened a storm of popular disapproval that fairly threatened the very existence of the bureau.

The newspapers and trade papers of the country united in denunciation of this method of securing financial support for the bureau with a unanimity that utterly disregarded party lines. Bills were introduced into the House of Representatives and the Senate having for their object the express prohibition of the practice of soliciting advertisements for government publications, and the matter even came before the Cabinet. The death of Mr. Smith and the prompt abandonment of the obnoxious policy by his successor alone ended the agitation.

We are sure that when the present director, Mr. Rockhill, looks into the matter more carefully, he will recognize the impropriety of permitting the revival of this thoroughly discredited policy, and will immediately order its discontinuance. It is true, as the firm of advertising solicitors assert in their circular, that the *Bulletin* is "the only publication printed by the United States government in which advertisements appear." This is precisely the reason why the policy should be abandoned. It is one too many.—*American Exporter*.

THE EXCELSIOR CARPET CLEANING WAGON.

THIS wagon was designed for hauling mattresses a distance over very hilly roads. It is very light, but strongly built, is 11 feet long, and will carry eighteen mattresses. The springs are extra long, which makes it very easy riding, either loaded or light. The seat is wide enough for two persons, and there are two platforms each side, on which a roll of carpet can be carried. The capacity of the



MATTRESS AND CARPET WAGON.

wagon is 1,400 pounds and the amount of available space for bulky loads is great. It is considered the perfection of a wagon for carpet cleaners and upholsterers. The body is painted deep orange and lettering in silver. The running gear is painted light yellow, with vermilion striping. It was built by T. H. H. Messenger, of Wilmington, Del., who is constantly studying the wants of tradesmen and merchants, and can produce practical vehicles for all special purposes.

PROP SPRINGS AND LEVERS.

THE value of prop springs and levers for carriage tops as aids when raising and lowering carriage tops from the inside, is universally acknowledged, and time has demonstrated that there is nothing on the market that does the work so satisfactorily as those



MRS. ALICE M. ETTLING.

manufactured by Cateley & Ettling, of Cortland, N. Y. Mrs. Alice M. Ettling, the head of the firm, is conducting the business in a manner that insures satisfactory goods and prompt shipments. The cost of these attachments is so slight that every builder can afford to use them, as every dealer finds them aids in selling.

A NEW DEPARTURE.

THE Delaware, Lackawanna & Western R. R. management has made a new departure, by which they hope to systematically develop its local business, and have appointed William B. Hunter as Industrial Agent, his duties being to encourage and promote the location of and to develop industries along the company's line. Mr. Hunter has had charge of the advertising department of the road for years, and now combines his former with the new duties. Few roads offer better opportunities for the development of industries along their lines than the Lackawanna, and Mr. Hunter's experience will be found valuable to all who contemplate industrial ventures along its line.

PARTIAL DESTRUCTION OF THE STANDARD VARNISH WORKS.

THE Standard Varnish Works narrowly escaped destruction by fire on May 4. By some unexplained cause one of the large tanks exploded and took fire, the great heat caused others to explode, and the burning oil spread over the water fronting the works, and for a time threatened serious consequences. The result, however, was that the fire was confined mainly to that portion of the plant which contained raw material, leaving their stock of varnishes unimpaired, and the working portions of the factory uninjured, and will not interfere in any way with the filling of orders or making up stock. Their customers therefore will suffer no inconvenience from the fire.

THE VEHICLE, HARNESS AND IMPLEMENT EXHIBIT.

AN exhibit of finished vehicles, harness and implements will be held in Cincinnati during the week beginning November 19 next, in Music Hall. It will be held under the auspices of the Tri-State Vehicle and Implement Dealers' Association. Messrs. Monte L. Green and George W. Huston, of the *Spokesman*, are managers. The indications all point to a large exhibit. The Tri-State Association hopes to interest exhibitors and make this, the first display of the kind ever held in the West, interesting and valuable to all, and thus aid toward building up this young association to a foremost position. The utmost liberality is extended to all, and no special privilege will be given to any. The management is not making this a speculative venture, the charges for space being no more than is absolutely necessary to cover expenses. The amount of space already subscribed for is a guarantee for a specially large exhibit, and it is expected that an unusually large number of dealers will be present during the week. Cincinnati has always enjoyed the distinction of being a most enjoyable city to visit, and her citizens are exceptionally good entertainers. We may therefore expect a large attendance, and can guarantee a goodly round of pleasure during other than business hours.

STAR QUICK SHIFTER AND ANTI-RATTLER.

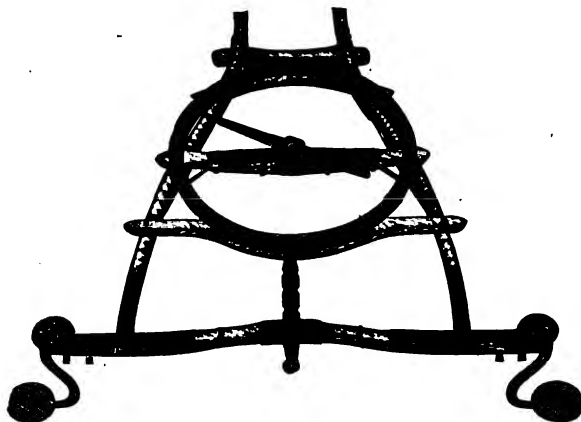
THE Star Manufacturing Co., of Princeton, Ill., manufacture the above articles, and are having a great demand from western buyers. Their eastern sales are less satisfactory, but the company feel assured that the East would rival the West in purchases if the merits of the Star quick shifter and anti-rattler were as well known. The company has been in working order only eight months, and yet they have sixty carriage builders and thirty-four jobbers on their list of buyers. G. J. Farinsworth, of Los Angeles, Cal., is their agent for the Pacific Coast. They have agents also at Bendigo and Melbourne, Australia. The demand has been such that the company has been compelled to erect an addition to their factory, 75 x 100 feet, two stories high. Write to the company for further information.

STATE ASSOCIATION OF HORSESHOERS.

PURSUANT to a call by the Miami County Association of Horse-shoers and Blacksmiths about 100 persons engaged in these pursuits assembled at Peru, Ind., and formed a State organization and elected officers as follows: Dennis Egan, Indianapolis, president; Jerry C. Connell, Lafayette, first vice-president; Frank Parry, Fort Wayne, second vice-president; John W. Volpert, Peru, secretary and treasurer. Several addresses were made, and much interest was shown by those present. A reception in the evening and a ball were the closing events, and all departed feeling that the meeting had been a success in every way.

ALLENTOWN PLATFORM CO.

THE Allentown Platform Co., of Allentown, Pa., manufacture a full line of platform gears for business wagons, trucks, etc., of the regular and special patterns. They have patent iron platforms for



PHILADELPHIA PATTERN PLATFORM GEAR.

drop pole and shafts, also for stiff pole and shafts and for short turn gears. The line is a very complete one, and those wanting these goods should communicate with the company and learn more about their line of gears and their prices.

H. D. SMITH & CO'S NEW YORK OFFICE.

ALL interested in the manufacture of carriage forgings will be pleased to learn that The H. D. Smith & Co., of Plantsville, Conn., have opened an office in the Postal Telegraph Building, 253 Broadway, New York City, where samples of their forgings can be seen and general business transacted. This company has always maintained a high standard of excellence for their work, and have been recognized as makers of high grade drop forgings for carriages and other work. They have never receded from the position that good goods were preferable to lower grades, quality, not price, being the key note, but at the same time prices have been reasonable, while the uniform quality and style that has been maintained has made it possible for buyers to duplicate their work. The company call special attention to their superior facilities for producing high grade drop forgings for automobiles, bicycles, typewriters, sewing machines, etc., as well as their large and standard lines of carriage forgings. Their fifty years' experience makes this a desirable house to deal with.

AN EXHIBITION AT PARIS.

THE Ferracute Machine Co., of Bridgeton, N. J., have three exhibits of presses, dies and other sheet-metal machinery at Paris, as follows: Main exhibit, Block 8, American Machinery Department, Champ de Mars; coining machinery, United States Government Exhibit, Champ de Mars; heavy machinery in Block 5, Machinery Annex, Vincennes. All are cordially invited to visit these exhibits. The company's representative's address is Adolphe Janssens, 16 Place de la Republique, Paris. All who saw the company's exhibit at the Export Exposition in Philadelphia last fall will feel that the company will do honor to American skill and genius by this exhibit.

BUSINESS BRISK.

SCHAEFER & SCHLEGEL, manufacturers of fine carriage, hearse and casket trimmings, at Rochester, N. Y., write us that they are very busy in regular work, and are selling a great deal of lace to the automobile builders. To meet the demands upon them they are constantly adding new and improved machinery, thus keeping their plant up to date in every respect.

CEDARS TWENTY CENTURIES OLD

THE sturdy, storm-enduring red cedar, says John Muir in the April *Atlantic*, delights to dwell on the tops of granite domes and ridges and glacier pavements of the upper pine belt, at an elevation of seven to ten thousand feet, where it can get plenty of sunshine and snow and elbow room, without encountering quick growing, overshadowing rivals. It never makes anything like a forest, seldom comes together even in groves, but stands out separate and independent in the wind, clinging by slight joints to the rock, living chiefly on snow and thin air, and maintaining tough health on this diet for at least 2,000 years, every feature and gesture expressing steadfast, dogged endurance. * * * Some are undoubtedly more than 2,000 years old. For though on good moraine soil they grow about as fast as oaks, on bare pavements and smoothly glaciated over-swept granite ridges in the dome region they grow extremely slowly. One of the Starr King ridge, only two feet eleven inches in diameter, was 1,140 years old. Another on the same ridge, only one foot seven and a half inches in diameter, had reached the age of 834 years. The first fifteen inches from the bark of a medium-sized tree—six feet in diameter—on the north Tenaya pavement, had 859 layers of wood, or fifty-seven to the inch. Beyond this the count was stopped by dry rot and overgrown wounds. The largest I examined was thirty-three feet in girth or nearly ten in diameter; and though I failed to get anything like a complete count, I learned enough from this and many other specimens to convince me that most of the trees, eight to ten feet thick, standing on polished glacier pavements, are more than twenty centuries of age rather than less. Barring accidents, for all I can see, they would live forever. When killed they waste out of existence about as slowly as granite. Even when overthrown by avalanches, after standing so long, they refuse to lie at rest, leaning stubbornly on their big elbows as if anxious to rise, and while a single root holds to the rock, putting forth fresh leaves with a grim, never-say-die and never-lie-down expression.

GLINES' LIQUID RUBBER.

ALTHOUGH not implied by its name, Glines' Liquid Rubber is a solution for healing punctures instantly in automobile pneumatic carriage, sulky and bicycle tires. It is designed to be put in the tire before it is punctured, new as well as old tires, then you are ready for the puncture at any time it should happen. It is always ready when needed; cannot dry up, be lost or borrowed; is carried out of sight, where it should be, in the tire; does not injure the tire nor



RETAILS FOR 50 CENTS.

interfere with larger repairs, actually preserves the rubber, never thickens in cold weather, is applied in a few minutes by any one; contains no spirits, acids or alkalies; is guaranteed in every way by a responsible concern. It is put up in gallon and half gallon cans for shop use, half pint cans, and four ounce collapsible tubes, which screw to the valve, doing away with having to use a pump to inject it. They will gladly quote prices to anyone writing them.

GRAND RAPIDS CARVED MOLDING CO.

WE wish to call the attention of the readers of THE HUB to the product of the Grand Rapids Carved Molding Co., of Grand Rapids, Mich. The illustration herewith represents a molding produced by this company. The moldings are not pressed or mashed, but cut from the solid wood, leaving the grain perfect, and the lines as clean and sharp as hand work, at a very small per-cent. of the cost. This company's goods are extensively used in all classes of wood work, where nice clean cut moldings are desired. From a small beginning,



some ten years ago, they have grown to a very large institution, and not only enjoy a large trade in the home market, but also do a large export business, their goods going to all quarters of the globe. The carriage trade has been more or less familiar with their line for several years, and many handsome panels are made for some of the largest manufacturers in this country. Their work is also used extensively in interiors, and finishes up very handsomely in all woods. The company's office is done in mahogany, and is a lasting advertisement for this enterprising concern, the panels and wainscoting being trimmed with their moldings, and it is indeed a thing of beauty. The company will at any time take pleasure in furnishing samples and catalogue to anyone in the trade. If interested drop them a card, and ask for their latest catalogue.

Obituary.

FRANK H. HOOKER.

FRANK H. HOOKER, of Henry Hooker & Co., carriage manufacturers, of New Haven, Conn., died suddenly at his home in that city on April 13, in the fifty-seventh year of his age. Mr. Hooker's business life was spent entirely in the carriage business, in which he enjoyed a prominence obtained by few; he was also an active member of the Carriage Builders' National Association, of which he became a member in 1877, and since which time, up to the day of his death, he was almost without intermission an active worker. He served for many years on the executive committee, of which he was a member at the time of his death. He was secretary and treasurer for six years, from 1881 to 1887, and president in 1891, and at



FRANK H. HOOKER.

Born January 14, 1843. Died April 13, 1900.

various times a member of important committees, and in whatever capacity he enjoyed the utmost confidence of his associates to an unusual degree. He was born in New Haven January 11, 1843, and graduated from Yale in 1864. Very shortly after his graduation he entered the carriage factory of his father, and on his death, in 1873, become the head of the house. The plant has long been recognized as one of the largest and most important in New England. Mr. Hooker was a man of rare good taste, as well as a careful, competent business man. He was fond of travel, and being a lover of art, surrounded himself with rare collections, notably a famous collection of old blue china. As an employer he was highly esteemed by his employees, for whom he always had a good word. He was a direct descendant in the eighth generation of the Rev. Thomas Hooker, of Hartford, the founder of the Connecticut Colony, and was the son of Henry Hooker and Charlotte Lum.

He had enjoyed a fair degree of health, and on the day before he died he drove out to Brookside, Conn., to visit his great-grandfather's old farm. He spent the day there, and returned home in the best of health. He was a punctual business man, and when he did not come to his breakfast in the morning his youngest son went to his room and discovered that he had died while asleep. He married, in 1868, Miss Grace Russell, daughter of Henry E. Russell, a wealthy manufacturer of New Britain. Mrs. Hooker died in 1881. Mr. Hooker leaves two sons and a daughter. He was a director of the Tradesmen's Bank, of New Haven; a trustee of the New Haven Savings Bank, ex-president of the National Carriage Builders' Asso-

ciation, a director in a large number of corporations and clubs and vestryman of Trinity Episcopal Church, of New Haven.

His funeral service was held in Trinity Church, where a large number of friends gathered to attend the last rites over a departed associate. The floral tributes were numerous, one of the most notable being presented by the employees of Henry Hooker & Co. His associates in the carriage trade in New Haven were present, while a large number came from their distant homes to attest the appreciation in which he was held. Of the officers of the C. B. N. A. were Morris Woodhull, of Dayton, O.; Henry C. McLearn, of Wilmington, Del.; C. F. Kimball, of Chicago, Ill.; F. B. Judkins, of Merrimac, Mass., and D. M. Wilson, of New York City. In addition there were the following: Fred. F. French and B. G. Mansfield, of Boston; Charles J. Richter, George Stivers, W. F. Adams, J. W. Renwick, C. H. E. Redding, M. G. Woodhull, L. H. Kronfeld, W. Weesi, Edward Kearney, J. C. Graham and W. N. FitzGerald, of New York; Thomas Boudreau, F. B. Hawley and Frank J. Naramore, of Bridgeport, Conn.; Theodore Gray, Franklin Murphy, Jr., Theodore E. Beck and ex-United States Senator James Smith, Jr., of Newark, N. J.

The workmen of Henry Hooker & Co. attended in a body. They formed in files on either side of the walk leading from the street to the church door, and after the remains and funeral cortege passed into the church they passed in and occupied seats reserved in the body of the church. Mr. Hooker leaves behind him two sons and a daughter, his wife having died in 1881.

JOHN AUGUST ELMENDORF.

IN the April issue of *THE HUB* we announced the death of John August Elmendorf, which occurred at the time our last form was going to press. Mr. Elmendorf had suffered from ill health for several years, which prevented him giving close attention to business, but he was confined to his bed only about two weeks before his death. Mr. Elmendorf was born at Kingston, N. Y., on September 11, 1828, and his boyhood was spent in Waterloo, N. Y., where he attended an academy. In 1847 he came to New York City and began his business career in a wholesale dry goods house at 14 Wall street. In 1853 he became connected with Smith & Stratton,



JOHN AUGUST ELMENDORF.

Born September 11, 1828. Died April 5, 1900.

who were one of the oldest (if not the oldest) varnish houses in this country. He remained with this firm through its different changes of name to that of Edward Smith & Co., and when it was incorporated he became its vice-president.

In 1890 he was unanimously elected president of the Paint, Oil and

Varnish Club of New York, of which he was one of the organizers. He was for many years a trustee of the Fourth Avenue Presbyterian Church, an active member of the Board of Trade and Transportation, a member of the Holland Society, Sons of the Revolution, and a prominent Mason. He was a strong Republican, and a few years ago was chairman of the Republican Committee of the district in which he lived. He never held public office.

In 1855 he married (his wife dying about ten years ago). Three children survive them, Prof. Dwight Lathrop, the traveler and lecturer, John Barker and Mrs. Carr, the wife of Dr. W. L. Carr.

Mr. Elmendorf was an energetic business man, and made friends everywhere by his sterling integrity and genial manner, and his absence will be felt by his old business associates as well as in his social relations.

RESOLUTIONS BY BOARD OF DIRECTORS.

NEW YORK, April 13, 1900.

Editor of THE HUB,

DEAR SIR.—The following preamble and resolutions were adopted by our Board of Directors concerning the death of our esteemed vice-president, Mr. John Augustus Elmendorf,

Yours truly,

EDWARD SMITH & Co.

A. M. BATES,

Secretary.

At a meeting of the surviving members of the Board of Directors of Edward Smith & Co., called for the purpose, the following preamble and resolutions were unanimously adopted:

WHEREAS, our recent business associate and beloved friend, Mr. John Augustus Elmendorf, has been a member of this Board since the incorporation of this company and has been connected with the business for forty-seven years, and

WHEREAS, his counsels and energy have been influential in the conduct of the business from the beginning of his connection with it, and

WHEREAS, he has devoted the best efforts of a long life to its establishment and prosperity, and

WHEREAS, his admirable qualities of heart and mind have endeared him beyond all power of words to express to all his associates, and

WHEREAS, his death has caused a vacancy in our office and a blank space in our hearts which can never be filled,

Therefore be it

Resolved, That the surviving members of this board wish to express in this manner their esteem for and love of Mr. Elmendorf, their sorrow and regret at his removal, and their heart-felt sympathy, and share in the bereavement of his family and numerous friends, and be it further

Resolved, That copies of this preamble and resolutions be spread upon the minutes of the Board and sent to his children and the trade publications.

PETER WEBER.

PETER WEBER, of Syracuse, N. Y., a member of the firm of Ackerman & Weber, died on April 24, at the family home. He was sixty-four years old, and had lived in that city more than half a century. He was a pioneer in the carriage business. He is survived by three children, John and Daniel Weber and Mrs. Joseph Baumbach.

RUFUS WRIGHT.

RUFUS WRIGHT, of Morgan & Wright, Chicago, died on Sunday, April 15, from the effects of a pistol wound accidentally inflicted the day before. Mr. Wright was born some seventy years ago, near Cleveland, O., and went to Chicago from Akron twenty years ago. The firm of Morgan & Wright was organized in 1882. Before engaging in the rubber business Mr. Wright gained considerable of a reputation as an artist. He painted portraits of Lincoln and all the members of his cabinet.

Although no house in the tire and rubber trade is better known than Morgan & Wright, Mr. Wright was known personally to comparatively few, and of late years, at least, has not taken a really active part in the firm's affairs, the duty falling on his partner, F. W. Morgan, who is also his son-in-law. Mr. Wright's remains were interred at Akron.

SELLING OUT THE MACHINERY.

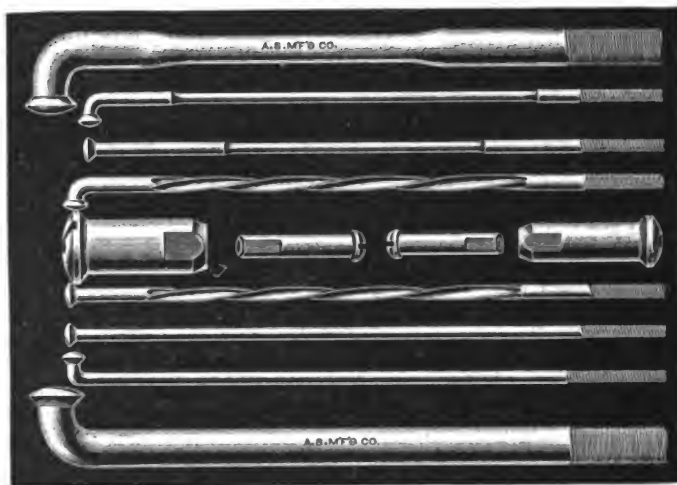
THE entire wheel-making machinery and tools formerly used by the New Haven Wheel Co., on the premises of the company, corner York and Ashmun streets, New Haven, Conn., will be sold at auction to the highest cash bidder. Sale will begin at 10 A. M. on May 17 and continue until finished. Complete schedule furnished upon application to the Lee & Osborn Co., New Haven, Conn.

MR. WEST WINS ON AN APPEAL.

THE readers of THE HUB will remember the publication in its columns of a suit for damages against J. B. West, of Rochester, N. Y., brought by the Swiss Laundry Co., of Rochester, whose horse was frightened by Mr. West's steam automobile and running away damaged the wagon and harness. Mr. West was defeated in the Municipal Court, and adjudged to pay \$42.95 damages and \$10.95 costs. Mr. West appealed, and on April 19 Judge Sutherland handed down an opinion reversing the decision of the lower court. The judge took the ground that the horse has no paramount or exclusive right to the road, and that his taking fright at some new object does not constitute a cause for action. He might take fright at a prairie schooner or other obsolete article. He cites bicycles and street cars as illustrations, but at the same time he bars the running of puffing, snorting contrivances, trailing clouds of smoke and steam. He requires that due care be taken by both owners of horses and automobiles. The decision is an interesting one, as it is the first of the character.

IMPORTANT TO MAKERS AND USERS OF WIRE WHEELS.

THE American Specialty Manufacturing Co., of Hartford, Conn., manufacture a high grade of spokes and nipples for wire wheels, for carriage and automobile wheels. This company, from long experience, is qualified to give full information regarding sizes, etc., for



SPOKES AND NIPPLES FOR WIRE WHEELS.

wheels of every weight. This is an important matter, as carriage and automobile builders have had limited experience along these lines, and many of the failures of wire wheels have been due solely to the want of knowledge as to sizes required and qualities. The company is in a position to make prompt delivery of all orders for regular sizes of automobile and carriage spokes and nipples, and guarantee that the quality and finish in all cases will be of the highest class. See the company's advertisement in this month's HUB.

AN OLD PRIZE OFFER.

A BILL was passed by the Wisconsin State Legislature on March 5, 1875, which virtually offers a prize of \$10,000 for an invention. The *Motor Vehicle Review* recently investigated the law, which was found on the statute books. The first section of the law enacts that the sum of \$10,000 shall be paid to any citizen of Wisconsin who shall invent and, after five years' continuous trial and use, shall produce a machine propelled by steam or other motive agent which shall be a cheap and practical substitute for use in place of horses and other animals on the highway and farm. Any machine entering for the prize must perform a journey of at least 200 miles on the common roads of the State, on the continuous line north and south, propelled by its own power at an average rate of at least five miles per hour working time. The other sections provide that the vehicle must be of such construction and width as to conform with or run in the ordinary track of the common wagon or buggy, and be able to run backward or turn out to accommodate other vehicles. It must also be able to ascend and descend a grade of 200 feet for a mile.—*Scientific American*.

Trade News.

BY UNCLE SAM.

ALABAMA.

GURLEY—The Enterprise Spoke Co. is meeting with such a demand for their spokes that the company has been forced to double their plant. The machinery has arrived and work will begin at once on the addition.

HUNTSVILLE—J. W. Skinner & Son have awarded a contract for the building of a carriage factory on Greene street, at a cost of \$25,000. The building will take the place of one destroyed by fire.

CONNECTICUT.

NEW HAVEN—Willis E. Miller has been elected treasurer and a director of the firm of Henry Hooker & Co., carriage manufacturers. This action was taken at a meeting of the directors held at the office of the concern recently. Mr. Miller succeeds Frank H. Hooker, who died recently. There will be no other changes in the directory of the firm. Mr. Miller is now at the head of several thriving corporations, among them the Hygeia Ice Co., the Mount Carmel Bolt Works, the Mount Carmel Axle Works, and now of the carriage manufactory. In the manufacture of axles Mr. Miller has become conversant with the carriage manufacturing business. Mr. Miller and Mr. Hooker were very close friends, and his selection to fill the vacancy caused by Mr. Hooker's death meets with general favor with the officers of the concern. Edwin Marble is president of the company, which is capitalized for \$200,000.

GEORGIA.

ATHENS—James T. Hart, of this city, has taken out a patent for a wagon brake. The invention, while simple, is very efficacious. It relates to an improvement in wagon brakes, and more particularly to that class of brakes on drays which are dropped to a position in front of the wheel and form a temporary runner which receives the weight of the wheel, and by its friction on the ground arrests the speed of the vehicle. To set the brake it is simply necessary for the driver to pull upon a rope, when the wagon is at once arrested.

AUGUSTA—The spoke factory of the Edward F. Barrows Co. has been completed and is in successful operation.

ILLINOIS.

BRADLEY—A new company has been incorporated here, called the Bradley Buggy Co., which is in fact a reorganization of the Piqua Wagon Co., which was destroyed by fire at Piqua, O., last January. They have an up-to-date plant, filled with new machinery, which was started up to see if everything worked all right April 16. Everything went nicely, and the production of Bradley buggies and road wagons in large quantities begins at once. With plenty of new stock and with experienced workmen—many of them from the old Piqua plant—the orders which they have been receiving from their old patrons, and new, will be in the way of being filled early in May. Mr. C. F. Rankin, who was secretary and treasurer of the Piqua Wagon Co., is president and general manager of the new establishment.

OTTAWA—The Gay Carriage Factory was damaged by fire on April 1. The loss is estimated at \$50,000, and 150 men are temporarily thrown out of employment. Insurance amounting to \$63,500 was carried.

INDIANA.

GAS CITY—The new buggy and harness branch store of the Wigger Buggy & Harness Co. will soon be opened.

MARION—The Indiana Hub Block Co., of Marion, has been incorporated. Capital stock, \$20,000. Directors: F. R. Wilkinson, W. A. Beasley, Fred. G. Seitz, H. J. Scheid and A. L. Reed.

ROCKVILLE—Pierce & Gilligan have opened a buggy and harness store on the East Side, with James K. Meacham in charge.

TERRE HAUTE—Receiver A. M. Higgins, of the Terre Haute Carriage & Buggy Co., having established with much success special agencies in New York and Philadelphia, has now closed with Deeds & Manley, 508 North Main street, St. Louis, to handle the trucks made by the company. The three great agencies now established, together with what will be done from the home office here, will keep the plant busy.

Fouts & Hunter, carriage builders, had an opening the first week in April, and showed a very fine line of vehicles. This factory has a repository as large as any other in the State. The variety of vehicles shown is unsurpassed anywhere.

IOWA.

BURLINGTON—J. L. Kelley & Co. have been in business in Burlington for thirty years, and have built up a large and profitable business. Their large three-story building is filled from basement to roof with agricultural implements, vehicles, etc. The second floor is converted into a vehicle repository, stocked with buggies, traps, gentlemen's driving wagons, carriages, phaetons, surreys, stanhopes, spring wagons, road wagons, and other kinds of vehicles. They start this spring with an elegant new stock of the handsomest, latest and best vehicles on the market. Everything is up to date. They also offer a complete line of accessories, such as light harness, whips, robes and dusters.

DUBUQUE—The A. A. Cooper Wagon & Buggy Co., successors to A. A. Cooper, has filed articles of incorporation with the county recorder. The capital stock is fixed at \$100,000, divided into shares of \$100 each. The transfer of stock must be approved by the other stockholders of the company. The business is to be managed by a board of directors comprising A. A. Cooper, William F. Cooper and A. A. Cooper, Jr.

KENTUCKY.

HENDERSON—The Delker Buggy & Phaeton Co., of this city, is one that should be appreciated by every citizen. This factory has gained a national reputation for the superiority of its vehicles, and, as is the case with all such, is unable to keep even with its orders. There is hardly a State in the Union that has not in a measure patronized the Delker factory.

KANSAS.

WICHITA—The new firm of Burrell & Heitt have opened their place of business, which will be known as the Western Carriage Repository, at 203 North Main street. They will put in a complete line of vehicles, light vehicles, harness, etc.

MAINE.

BANGOR—Hartley H. Hodge has leased the carriage workshops at York and French streets, and will do all kinds of carriage and sleigh work. Mr. Hodge was employed for a number of years by W. F. Whiton in the manufacture of Bangor buggies.

CARIBOU—F. L. Laffaty, the harness maker and carriage trimmer, has had some alterations made in his store on Main street. His ever increasing business has made it necessary to have more room and hire more men.

LEWISTON—The carriage factory of Wade & Dunton was completely destroyed by fire on April 20. The carriages in the repository were saved.

NEWPORT—J. E. Oakes, of the Eureka Carriage Top Co., is now very busy on a lot of tops for W. H. Davis, of Bar Harbor, the well-known buckboard maker. These will all be made of russet leather and will be a very novel top. Mr. Oakes has orders for a large number of tops for this season, and expects that he will have an unusually large amount of work this season.

PITTSFIELD—Sumner S. Smith has recently leased a shop in the Stroples Building on Lancy street, and will start a carriage emporium for the manufacture and repair of all kinds of carriages.

SULLIVAN—Charles H. Preble has bought the Lynam factory in Sullivan, and is building a large addition, which he will use for a blacksmith, carriage, repairing and paint shop.

MASSACHUSETTS.

ADAMS—F. H. Goodrich and J. R. Wicthauer have started a carriage shop on Park street, to be known as the Adams Carriage Co. They will deal in light and heavy wagons of all kinds.

AMESBURY—The carriage shipments for the month of March were 1,052, a slight increase over those of last year, but work in the factories, except in a few lines, is not as good and is not up to the expectations. Were it not for the building of automobile bodies the shipments would not equal those of the previous year. Those who are in close touch with the trade predict a short season, unless duplicate orders are forthcoming at an early date.

ANDOVER—Tuttle & Morrison, who about one year ago completed the purchase of the works and business of what had formerly been known as "Poor's Wagon Shop," have sold out their shop and land and purchased a site in the heart of the town on Park street. There they have erected a large three-story building and have equipped it with nearly everything necessary for the successful operation of their business interests. This building is fitted up with modern machinery and every appliance for a carriage factory. The firm are now employing eleven workmen.

HOLYOKE—Fenton & Sons' carriage factory was seriously damaged by fire on March 27. Damage estimated at \$10,000.

NORTHAMPTON—D. J. Wright says this is the best year for the carriage business for ten years. Everybody seems to want a new carriage.

LEOMINSTER—Petitions in bankruptcy have been filed by Charles E. Smith, of Leominster, carriage manufacturer. Liabilities, \$1,362; assets, none.

MICHIGAN.

BAY CITY—The Bay City Carriage Works have recently undergone an important change. Charles Goodden, senior member of the late firm of Goodden & Newcomb, having purchased the interest of Mr. Newcomb, and associated with him Al. Bigham, of Saginaw, a practical carriage and wagon blacksmith. The firm will build all kinds of vehicles, from a heavy truck to the finest surrey, and will also do all kinds of repair work.

FLINT—The Flint Wagon Works, which furnished employment to 500 men, were destroyed by fire on March 21. The fire started about 10 o'clock, and within two hours nothing was left of the vast concern except a smoldering ruin. The loss will reach \$200,000, with probably \$120,000 insurance. A gang of about fifty men is at work on the ruins of the main manufacturing building, clearing away the debris preparatory to the commencement of operations for rebuilding the structure. An architect is preparing plans, the brick has been bought, and work on the foundations of the new building will be begun within a week.

JACKSON—The Collen & Becker Carriage Manufacturing Co. recently shipped to Toledo, O., one of the finest single, pneumatic tired carriages ever built in the State, and they have another at the factory ready for shipment. Henry Hayden, treasurer and general manager of the company, said Saturday: "I have always been a crank on good carriages, and it is my ambition to make the best and to build up a reputation for good work." The company employs about seventy men at present. The officers are: President, W. S. Cobb; vice-president, L. A. Winchel; secretary and treasurer, Henry Hayden.

GRAND RAPIDS—The Belknap Co. is a scene of business energy on every one of its four floors. Mr. Belknap states that they are almost buried up in work. A force of fifty men are now employed, and prospects seem to be the best in years. This is all the more remarkable because wagons are costing from 20 to 30 per cent. more than they did last year. And still they sell. Another feature is that wagons of the better class are called for. The company will begin working on sleighs in August.

MISSOURI.

ST. JOSEPH—C. Tanner & Sons, builders of carriages, business wagons and vehicles of every description, have been favored recently with orders from Chicago, St. Louis, Kansas City and Cleveland. In addition to being extensive builders of vehicles, the firm have one of the largest repositories in the West, where they display a full line of carriages of every description.

MONTANA.

BUTTE—The firm of Bennett Bros. & Co., which for the past quarter of a century was a landmark in the western commercial world, has passed into history. On April 1 this old established firm was succeeded by Messrs. N. L. Olson & Co., composed of men who enter the field in which the old firm was so successful with vigor, enterprise and determination, which augurs well for a still broader business than that from which Bennett Bros. & Co. have retired. Continuing in the same line, N. L. Olson & Co. will carry the largest line of carriages, buggies, wagons, and horse furnishings in the State of Montana or the Rocky Mountain region. Everything conceivable on wheels may here be found, from the cheap buggy at \$35 to the most expensive phaeton, surrey or family carriage. In the harness department the stock is replete with the products of the leading factories of the country, especially designed and of a quality best suited to this region of hills and rocks. Everything for the horse toilet is shown, including robes for all seasons, blankets, combs, brushes, whips, etc.

NEW HAMPSHIRE.

BRADFORD—Albert Peaslee and Arthur Butler are preparing to open a carriage repository for the sale of new and second-hand carriages, in the old Benton shop, recently vacated by John P. Morse.

PENACOCK—A new addition is to be built at the Concord Axle Co.'s works soon.

NEW YORK.

ALFRED—Merton Place, who moved from Philipps Creek recently, is building a wagon and repair shop.

BROOKLYN—Schiverea & Stevenson Co., incorporated, to deal in blacksmith and wheelwright supplies; capital, \$25,000; directors: G. W. Schiverea and W. S. Stevenson, of Brooklyn.

CAMDEN—The firm of Stark Bros., carriage manufacturers, has been dissolved by mutual consent. Manley Stark withdraws from the firm, and the business will hereafter be conducted by J. W. Stark.

ROUND TOP—William Worden has his wagon shop completed.

COLASSE—J. D. Morse has opened a wagon shop in the room formerly owned by P. Gray.

NEW YORK CITY—The Charles S. Caffrey Co., of Camden, N. J., manufacturers of the famous "Caffrey" line of specialties in pneumatic vehicles, has opened a New York agency under control of A. C. Maynard, the well-known road driver, owner of "Brandywine," "Octavia," "Dolly Marchutz" and others. Frank Van Linda, for many years prominently identified with the carriage trade, has accepted a position as manager.

The Joseph H. Bauland Co. has opened a harness and vehicle department, under the management of H. I. Friewold, in Fulton street, Brooklyn.

The Lengert Wagon Co., of No. 302 West Fifty-third street, has been exceedingly busy the past ten days opening mail inquiries and entertaining callers who want to know about different kinds of vehicles. Business wagons of all kinds, as well as pneumatic road wagons, have also been having a large call.

"Business continues to be good," said Manager Clark, of D. P. Nichols & Co., manufacturers of hansoms, of No. 1706 Broadway. The call for hansoms not alone comes from this city, but from nearby places. A carload of hansoms are received at their Broadway place weekly.

Business in the new spring styles of wagons of all kinds has been brisk at the repository of the Peter Reidenbach Wagon Works, No. 163 Eldridge street, for the past week, with every indication of increased activity.

Edward Callanan's Son, of No. 57 West Forty-fourth street, is showing a capital lot of summer carriages of all kinds. The line of second-hand victorias, depot wagons, surreys and traps carried at this repository is very large. Business has been very good here the past week, both in the sale of carriages and also in repair work.

Messrs. Van Tassell & Kearney say that the spring trade has opened well. Sales for the last week have been heavy in all styles and weights of the many different kinds of vehicles that fill their immense repository. Their spring stock is full and complete, and one in search of anything in the carriage line can make a selection without loss of time. Their auction sales are growing larger as the season advances. Catalogues are filled with interesting entries of horses, carriages and harness, and every prospective buyer can be sure of seeing what he wants.

The Blaurock Carriage Co. report active business. New orders are being received all the time from all sections of the country.

J. B. Brewster & Co., 1619 Broadway, report a good spring business. They are filling a large number of orders from customers who intend spending the season at Newport, Saratoga, and other resorts.

Peters & Heins report new orders coming in all the time. They delivered one new police ambulance last week and a number of new light wagons.

Flandrau & Co., in Broome street, have just issued a neat and artistic catalogue of the pleasure vehicles shown by them. It is profusely illustrated with cuts of what would seem in glancing over them about every sort of vehicle ever designed by the human brain, yet they provide a draughting room where any special design suggested by their customers can be shown on an immense blackboard. They invite the attention of critical customers.

R. S. Luqueer & Co., of Murray street, announce a most complete and extensive stock of harness of every description, English riding saddles and every article necessary for the horse, stable, carriage or truck.

Elegant panel boot victorias, the latest of novelties in basket vehicles, pony traps and governess carts are being shown by James W. Renwick, in West Forty-sixth street. Opera buses and exercising breaks are also included in his stock.

SYRACUSE—The Whitney Wagon Works and other buildings were destroyed by fire on April 2. Loss, \$55,000. L. A. Whitney carried \$15,000 insurance.

H. A. Moyer, carriage manufacturer, stated that business with him was never better than at present. Orders are coming in daily, and the factory employs in manufacturing more than 300 men. Mr. Moyer has no fear of the automobile, and feels confident that it will never lessen the demand for carriages. Mr. Moyer exports carriages to some extent.

SCHENECTADY—Benns & Visscher have built up a large wholesale business in connection with their local retail trade, and are now the agents for a number of manufacturers who make Schenectady a general depot for all the Eastern States.

NISKAZUNA—L. B. Hudson, of Newtonville, has opened a wheelwright shop in this place.

UTICA—L. A. March has opened a carriage and wagon emporium at 57 and 59 Hotel street. He has a carefully selected stock of the very latest in the line of surreys, phaetons, pneumatic tired driving wagons, runabouts, top and open buggies. He will also carry a full line of harnesses, whips and robes.

WATKINS—S. H. Palmer, formerly a partner of the late John Goundrey, has purchased the Glenn W. Goundrey wagon shop, on Franklin street, and will hereafter conduct the same.

WHITNEY'S POINT—Business is lively at the Birdsell, Waite & Perry factory these days, and there begins to be a large demand for wagons for summer trade. Some forty hands are now employed in all departments. The new wicker work seats made by G. T. Buckley are being woven in a variety of attractive styles, and he already has out over twenty-five of them.

NEW JERSEY.

NEWARK—J. M. Quinby & Co. report a very brisk trade during the last week and a number of sales in the latest styles of pleasure vehicles. This firm devotes special attention to mail inquiries, and are prepared to give facts and figures on almost every kind of vehicle.

NORTH CAROLINA.

ELKIN—Active preparations have been begun upon the repairing of buildings to be used for the buggy factory. Messrs. Johnson & Williams are the proprietors of this new enterprise. They will employ several thousand dollars in capital, and the output of buggies and wagons will be considerable.

WILMINGTON—A new factory for the White Patent Axle & Hub Co. is nearing completion on the W. C. & A. Railroad, near Waccamaw.

OHIO.

BUCYRUS—T. M. Drolesbaugh, dealer in agricultural implements, wagons, carriages and harness, has filed a petition in voluntary bankruptcy. For several years Mr. Drolesbaugh has been doing business in Norwalk, but recently returned to Bucyrus and re-established himself at his old stand on North Sandusky avenue. He files a schedule of assets of \$9,115.36 and liabilities of \$8,051.14, showing an excess of more than a thousand dollars in assets.

CINCINNATI—In the receivership of the Favorite Carriage Co. an entry was made in the Common Pleas Court which will practically close out the business of the receiver. It shows that the claim of the Third National Bank has been paid in full and that J. D. Hearne has received \$22,209.99 on his claim. The receiver had \$74.81 on hand, and that was ordered paid to Mr. Hearne on his claim.

HAMILTON—Mr. F. A. Taylor, who has for some time past represented the Premier Manufacturing Co., of Hartford, Conn., recently resigned his position with that company and accepted another with the Columbia Carriage Co., of Hamilton, O. We believe that Mr. Taylor's association with the Columbia Carriage Co. will be pleasant and profitable to both.

MARIETTA—The foundation for the new plant of the Ohio Valley Wagon Co. has been about completed, and the work of erecting the building proper will commence in a few days. The large engine of 175 horse-power has been received from Pittsburgh, and other machinery is arriving daily.

PENNSYLVANIA.

CARLISLE—C. P. Stambaugh and E. A. Lau have rented the Vance property on West North street and have established a carriage factory on same.

SEIPSTOWN—Sechler Bros. recently had a dissolution sale of their carriages, etc., at their factory. Ex-County Treasurer James M. Sechler will conduct the business alone.

HANOVER—The Ketterer Manufacturing Co., who have a factory at Hanover, Pa., also a New York shop and repository, have just taken the five story building, 1707-1709 Filbert street, and running through to Cuthbert street, Philadelphia, for a repair shop, repository, etc. This firm enjoy the reputation of being among the leading builders of business wagons and specialty vehicles. One of the latter is the well known "Moxel" wagon.

VIRGINIA.

LYNCHBURG—The Thornhill Wagon Works were destroyed by fire on April 22. The loss is estimated at \$18,000; insurance, \$14,500. The works will be rebuilt at once.

WEST VIRGINIA.

PARKERSBURG—I. H. Wright has opened his new carriage store on Third street, and has on exhibition one of the finest lines ever exhibited in the city. Everything is new and up-to-date, and is displayed in a manner to attract attention. In addition to this store, Mr. Wright has a shop for repair and other work.

WISCONSIN.

WILMOT—Schmitt Bros.' Wagon Works were destroyed by fire on April 21. Loss, \$15,000; no insurance.

CANADA.

MONTREAL—David Dion is a builder of all kinds of light buggies and business wagons, and does all kinds of repairing as well.

Wants.

Help and situations wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word.

SITUATIONS WANTED.

Wanted—A steady job by a competent carriage painter and trimmer. An all-around man in both. Address, GILBERT DILLARD, St. Augustine, Fla.

By practical spring maker of thirty-five years' experience in leading factories, position as foreman, or to make and repair springs, with responsible concern. Have most of the tools necessary for same. Best references. Address, "SPRING MAKER," care of THE HUB.

HELP WANTED.

Carriage Trimmer—A good practical, all-around man wanted to replace man who has been with us for years. A steady job at good wages to right man. Address, stating experience, "REMMIRT," care of THE HUB.

A first-class carriage trimmer for heavy and light work. Would prefer a young unmarried man. Address, with references, stating salary expected, R. E. K. B., care of THE HUB.

Wanted—First-class carriage painter, good striper and finisher. Steady job. HOPKINS BROS., Waco, Tex.

A first-class foreman for carriage factory working at present about fifty men, building the best grade of work only—fine business wagons and heavy carriages. Would prefer a young man who is not married. Address, stating experience, references, salary expected, etc., R. E. K. A., care of THE HUB.

Wanted—Hustlers to secure new subscribers for THE HUB. A good chance to make money easily. Subscription price \$2.00 a year. Liberal commission paid. Address, Subscription Department, THE HUB, 24-26 Murray street, New York.

MATERIALS WANTED.

We are desirous of obtaining names of parties making finished castings, useful in small mechanisms. Our parts are small gears and dials for counters, ratchets, typewriter frame castings, and the like. UNIVERSAL LOCK CO., care of THE HUB.

PATENTS—H. W. T. Jenner, patent attorney and mechanical expert, 608 F street, Washington, D. C. Established 1883. I make an examination free of charge, and report if a patent can be had and exactly how much it will cost. Send for circular.

FOR SALE.

Two second hand spoke lathes in good condition. Address, I., care of THE HUB.

Brick carriage factory, excellently equipped for automobile building. Four stories, 70 x 128. Located on corner. Elevators, 40 H. P. Corliss engine, first class machinery, etc. City of 75,000, about 100 miles from New York. Splendid shipping facilities. Factory now in operation and in good condition. Address, "M 25," care of THE HUB.

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45 Plates of Alphabets, Sign Lay-Outs and
Scrolls, printed in Colors. Price, \$2.00 postpaid.

TRADE NEWS PUBLISHING CO.,
24-26 Murray St., New York.

COLOR SECRETS.

No. 28.—The Test of Genius.

In a Pullman smoking room a company of gentlemen were talking over routes and trains and service, when one of them remarked: "There are several ways of getting east and west, any one of which may be all right; but we all know that one can't make a mistake on the——Road."

The remark struck them as widely significant, and they expatiated on the wisdom of it. "Indeed," said the first speaker to this general theme, "the difference between mediocrity and genius, in the business world, is just the difference between things that may be all right and things you can't make a mistake on." Another said: "There is no excuse, in this day, for poor work or poor service anywhere. Fairly good ways of doing anything are so generally known that a poor shoe or a poor bicycle or a poor railroad or a poor anything is inexcusable: and yet, between the thing that may be all right and the thing you can't make a mistake on is as great difference of value as there used to be between poor work and fairly good work." "Correct you are," said a third. "There is no calculating the extra value of the thing you can't make a mistake on. The man who produces it is a genius because he appreciates the essential character of each of the ten thousand little things which go to the making of a business."

Thank you gentlemen! When you read this you will remember that the silent man took notes. He was thinking that you couldn't make a mistake on Murphy Varnish or Color.

MURPHY VARNISH CO.Please mention "The Hub" when you write.

We are the Only Manufacturers of Carriage Wheels



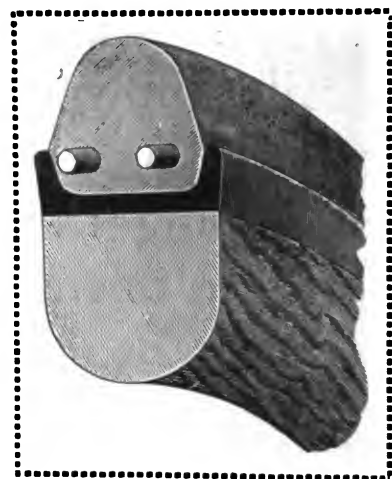
who make a specialty of applying rubber tires at our factory and sell the wheels complete.

WE USE

The Kelly Springfield Rubber Tire

...*BECAUSE*...

After undergoing the most severe and prolonged tests, it has been positively and thoroughly demonstrated that it is the most practical, longest lived and perfect solid rubber carriage tire made in the world.



They WILL NOT Roll Off.

Correspondence Solicited with Carriage Manufacturers and Dealers throughout the United States and abroad.



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BATAVIA, N. Y., U. S. A.

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WESTCHESTER, PA., U. S. A.

Makers
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WHEELS

For

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Automobiles,
Business Wagons
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MANUFACTURERS OF   BRANDS OF
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Heavy Wheels for Business Wagons a Specialty.

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The Acorn  Brand is made of Second
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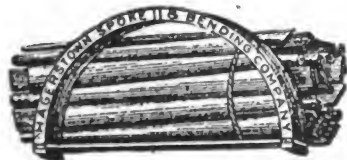
F. S. BARRICK, Sec'y.

S. A. MUNN, Treas.

A. S. HARING, Sept.

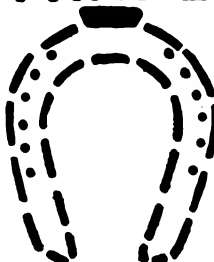
The **Hagerstown Spoke & Bending Co.** Hagerstown, Maryland,
U. S. A.

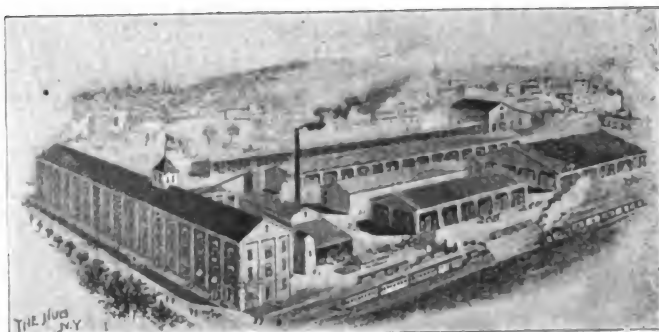
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**BALTIMORE...
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WHEELS

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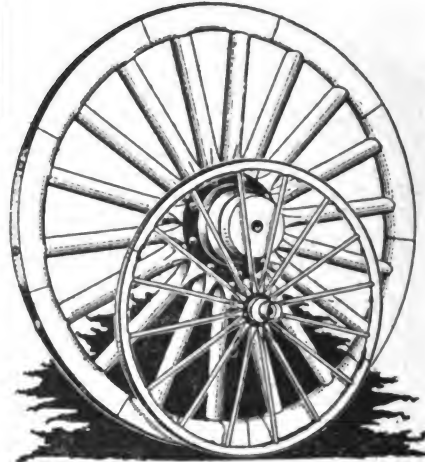
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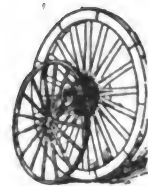


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A SPECIALTY.**

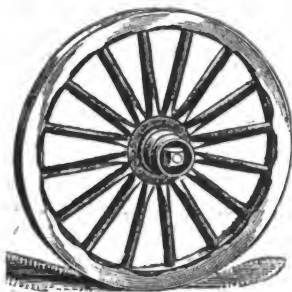
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CARR, PRESCOTT & CO.,

Successors to

BIDDLE & SMART CO. AND LOCKWOOD & BROWN,

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Telephone, No. 63-5.



J. B. KOLLER & CO.,

MANUFACTURERS OF

**Spokes, Rims,
Hubs and**

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**FINE
CARRIAGE
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E. FLICKINGER,

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Capacity 500 Sets per day.

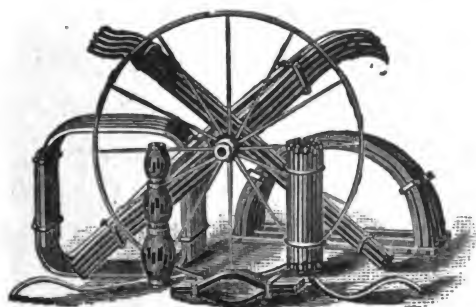
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The Wheel and Wood Bending Company,



WHEELS

MANUFACTURERS OF

Wheel Material and Bent Wood,

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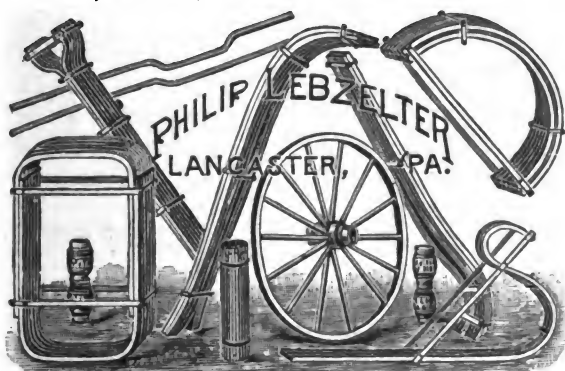
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WHEELS WITH STEEL TIRES.



WHEELS WITH RUBBER TIRES.

Established 1856.

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**JUST LOOK AT
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*They are "SO CONVENIENT
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*The Hub***BODIES ! BODIES ! BODIES !**

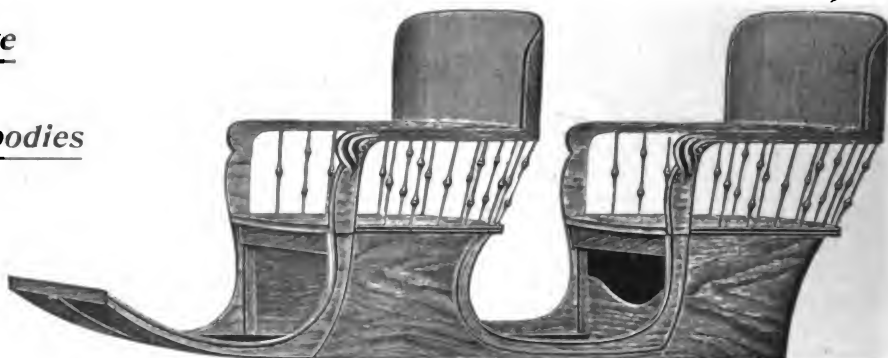
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A choice lot of stylish bodies
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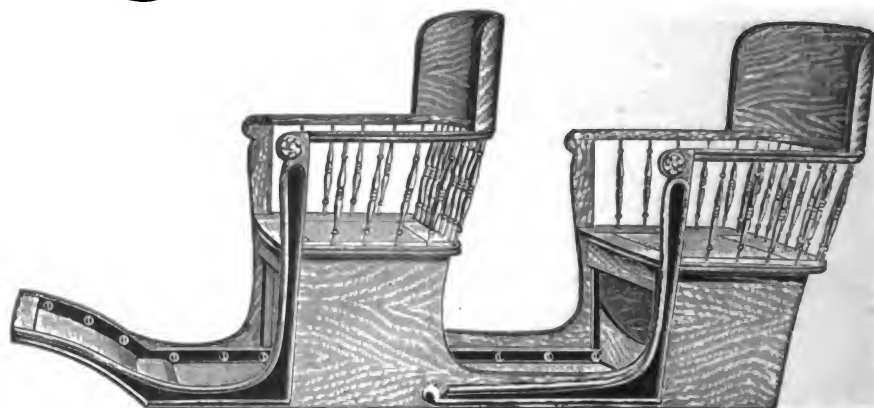
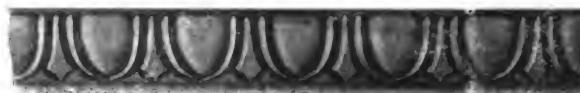
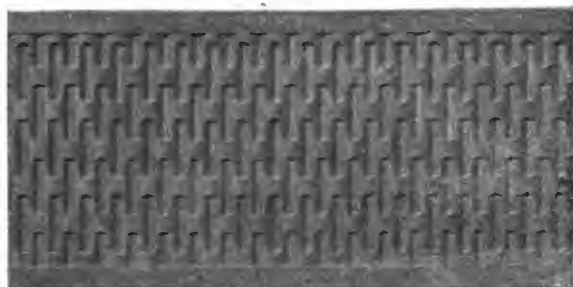
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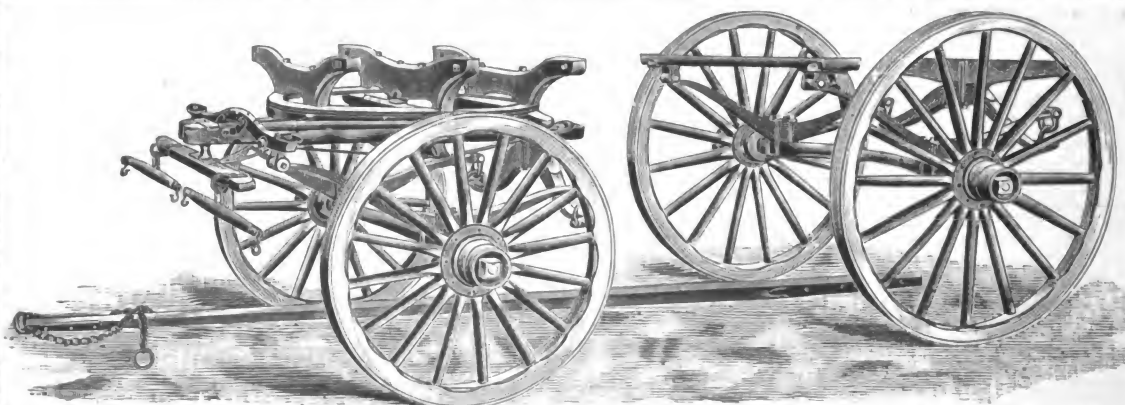
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Made in any wood, and any size to 12 in. wide to 12 feet long.

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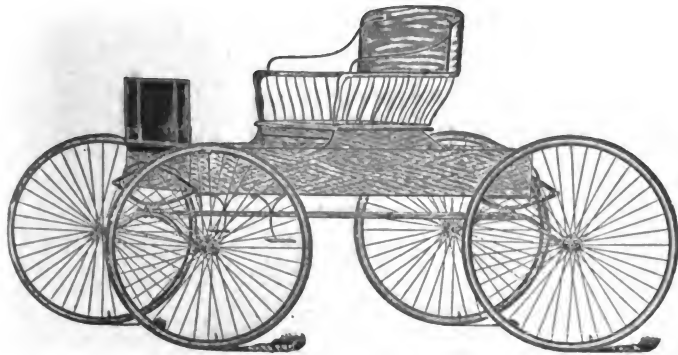
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Complete Gears as shown above ready to receive body, for light and heavy work, can be furnished promptly. In ordering give full specifications, or such description as will enable us to make up specifications. Dealers in wagon materials will quote prices on our gears.

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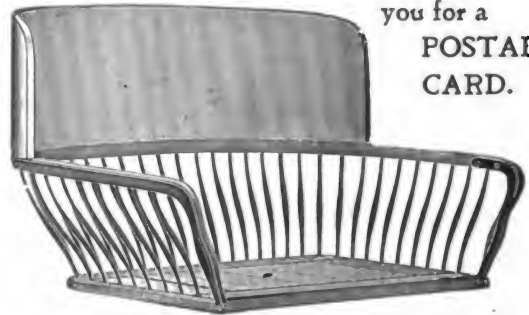


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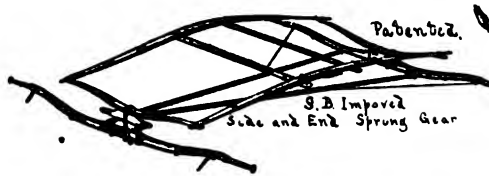
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SPECIALTIES
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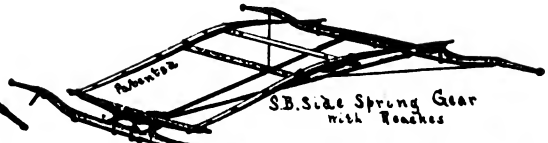
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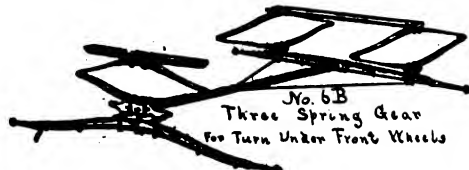
No. 785. STICK SEAT.



No. 19 Premier



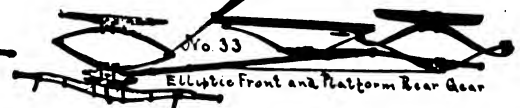
No. 33



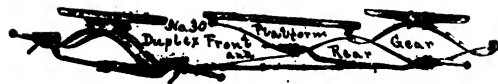
No. 6B
Three Spring Gear
for Turn Under Front Wheels



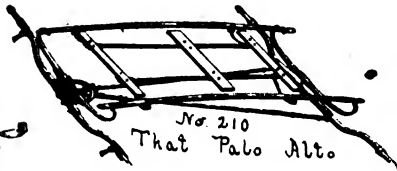
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No. 30
Duplex Front and
Rear Gear



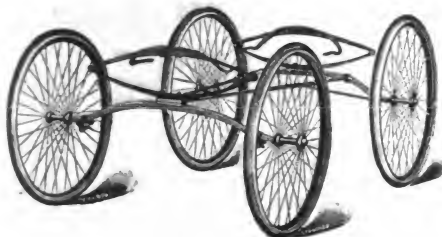
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O.M. Elliptic Gear

SCHUBERT BROS. GEAR CO., Oneida, N. Y., U. S. A.

WE DEFY COMPETITION.



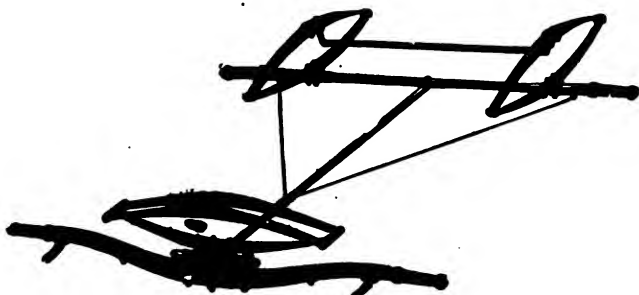
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IN THE WHITE, WITH WOOD HUB
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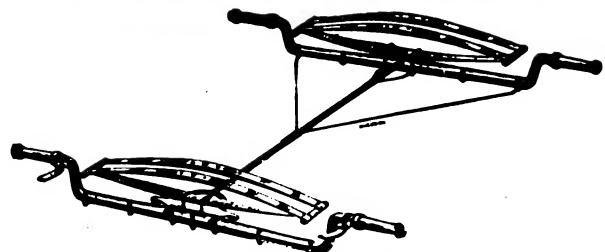
Fitch Pneumatic Road Wagon. (In the White).



Three-Spring Gear. Double Elliptic.

PRICES TO
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Send for our
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with full line of
gears, wagons
in the white
and carriage
specialties illus-
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Double Elliptic End-Spring Drop Axle Gear.

Manufactured Solely by

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Fitch's Improved Combination Short-Turn Duplex and Elliptic Gear.

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UNPARALLELED NIGHT SERVICE. NEW STEAMERS

"CITY OF BUFFALO"

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run the lines of the
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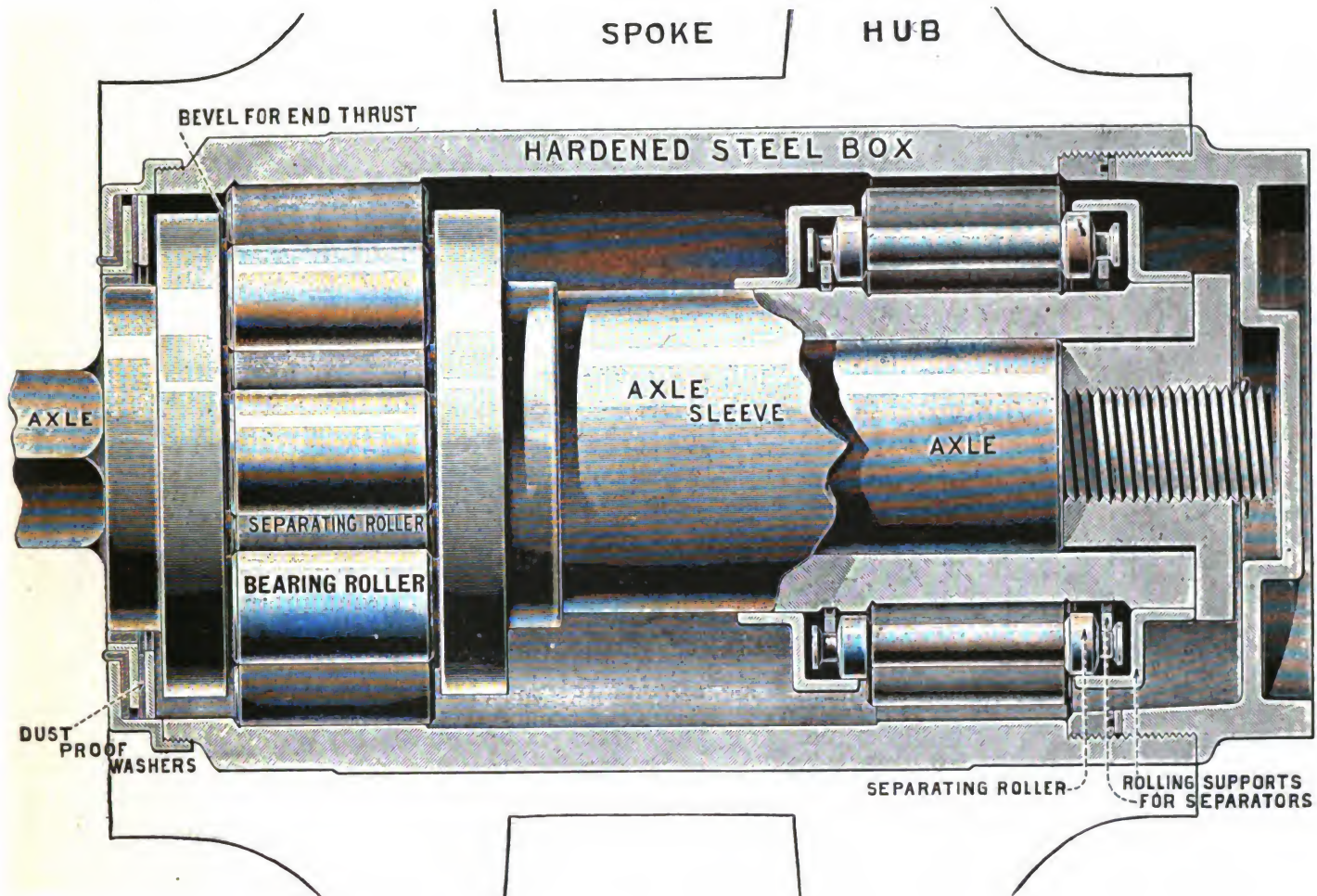
Intelligent Help of all Kinds

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To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered **TEXTILE INDUSTRIES** in the South by a number of good places. **GEORGE C. POWER**, Industrial Commissioner I. C. R. R. Co., Chicago.

THE AMERICAN ROLLER BEARING CO.

OFFICES, 27 State Street, **BOSTON, MASS.**
FACTORY, 32-40 Binford Street,



The A. R. B. Bearing is adapted to heavy work of all kinds. It has a number of features which distinguish it from any other Roller Bearing ever manufactured, among them are the following:

1. Its rollers are not held by pivots or confined in a cage of any kind.
2. The device for separating the bearing rollers is a purely rolling device, namely, a smaller set of intermediate rollers.
3. These separating rollers are held in position by purely rolling supports. So that there is no rubbing friction in the whole bearing, but only that slight friction which comes from the pure roll of one polished steel surface upon another.
4. All of the rolling parts are of a fine grade of steel, carefully hardened and accurately ground.
5. There is no complicated provision for the end thrust, but merely a hardened bevel against which the rollers roll when there is a thrust. These bevels have been found capable of withstanding the heaviest shocks and strains.
6. Once oiled (to prevent rust only) and the bearing needs no attention for six months or more.
7. A large electric cab wheel weighing about 150 pounds, and hung on a stationary axle, will run for one hour and ten minutes when

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8. The A. R. B. uses larger rollers, in proportion, than any other roller bearing, and consequently a slightly larger box is necessary—a fact which is amply justified by the great gain in strength, power and wearing qualities.

9. The A. R. B. is fully guaranteed, and it is about the only roller bearing that is guaranteed.

10. It is adaptable to a railroad car or a bicycle, to shafting and machinery of all kinds; for high speeds it is particularly successful, because of the absence of heating.

11. After a long series of competitive tests with many other roller and ball bearings, the A. R. B. has been adopted by many of the largest automobile concerns in this country.

12. With a pure rolling action, an ample bearing surface, and the most accurate mechanical construction, the A. R. B. stands to-day the only practically and theoretically perfect bearing in the field.

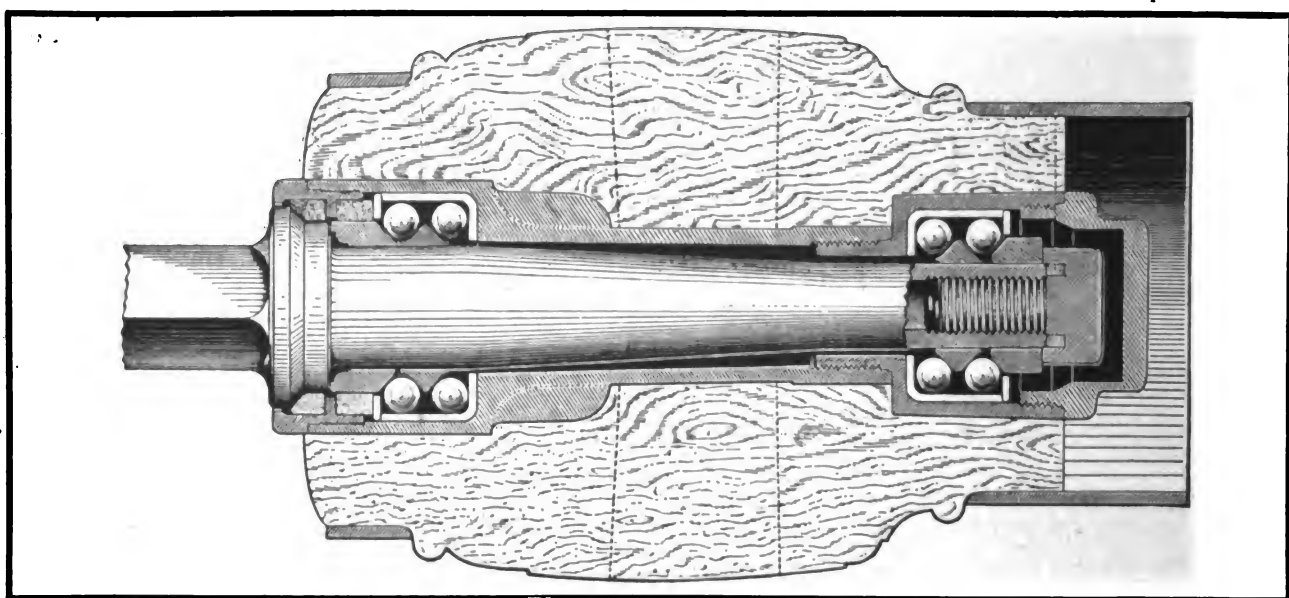
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An exhibit of the American Roller Bearing Company may be seen at the Paris Exposition of 1900, consisting of several odd wheels and models and two motor vehicles fitted with the A. R. B., one a Riker Electric Vehicle, the other a Locomobile.

Please mention "The Hub" when you write.

• THE • BAKER BALL BEARING AXLES

THE MOST NEARLY PERFECT ANTI-FRICTION AXLES IN THE WORLD.



THEY REQUIRE NEITHER SKILL NOR A MECHANIC TO CARE FOR THEM. ARE ADAPTED FOR ALL KINDS OF VEHICLES USING AXLES FROM 5-8 INCH TO 5 INCHES



These axles have been found by some of the most reliable automobile companies to be the best and most satisfactory anti-friction axles on the market.



THE UNITED STATES BALL BEARING CO.

Townsend Building, Broadway and 25th Street,
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A SUCCESSFUL AXLE

EMPIRE AND CHICAGO
BALL-BEARING AXLES and DUST PROOF BANDS,
 For Carriages, Trucks and Motor Vehicles.
 (Sizes, $\frac{1}{8}$ to 4 inches.)



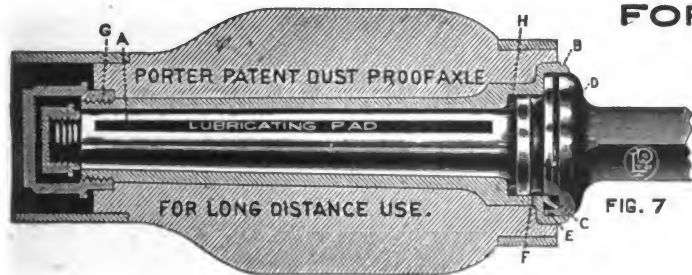
BALL-BEARING AXLE DEPARTMENT
 OF
 THE CHICAGO SCREW CO.,
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ESTABLISHED 1872.

Address All Communications to the Company.

Especially Satisfactory for Heavy Work.

"THE FAMOUS PORTER PATENT DUST PROOF AXLE." FOR LONG DISTANCE USE.



THE ONLY "2,500 MILE" STANDARD AXLE IN EXISTENCE

By actual test this Axle has run 2,500 miles with one oiling, and 1,500 miles with one oiling without the *Lubricating Pad*.

Porter Patent Ball Bearing Axle.

This axle is fitted with the Famous Porter Patent Dust Proof Collar and V-shaped extension, making it absolutely dust and water-proof.

7,000 sets in use. Never had a ball crush. Never had a call for repairs. Write for particulars.

Prices now within reach of all.

Manufactured by **Buchanan Ball Bearing and Dust Proof Axle Co.,**
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When your eye catches this, Stop. Take pen and write for NEW CATALOG and PRICE LIST.

We can interest you and give

Better Goods, Better Service than elsewhere.



Prices Interesting.
 Goods Satisfactory.
 You are Pleased.
 Save Time and Money.

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D. WILCOX MFG. CO., - MECHANICSBURG, PA.

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Concord Axle Company,



Original Manufacturers of the



GENUINE CONCORD AXLES.



CONCORD EXPRESS AXLES.



BROWN'S PATENT ROLLER BEARING AXLES.

*All of carefully selected stock and of
superior workmanship. ✱ ✱ ✱*

LOOK FOR THE TRADE MARK.



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CONCORD AXLE CO., **PENACOOK,** **N. H.**

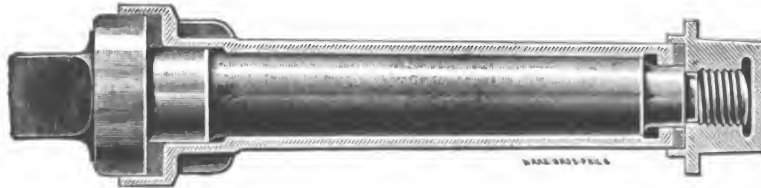
A Few of the Specialties

Manufactured by

DALZELL AXLE CO., SOUTH EGREMONT, MASS.

While they cost more, if you use them you will know the reason why.

Doctors' Special.



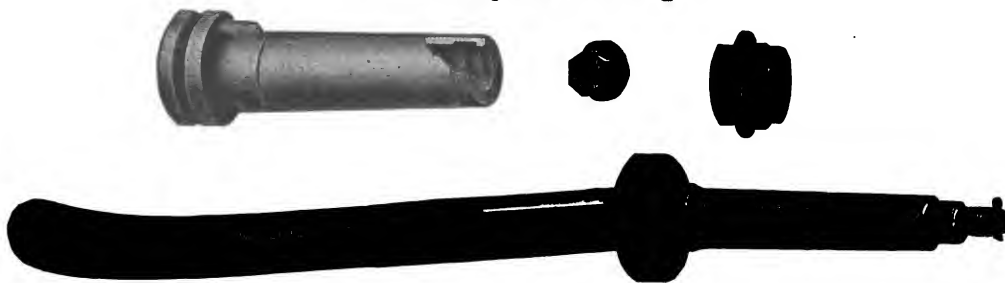
One valuable feature of this Axle is the broad washer bearing at both collar and nut, the broad metal bearing at the nut being obtained by making bridge and oil chamber as shown in cut. Also the increased diameter of arm adds to strength and safety. Fitted only with solid Wrought Iron Case Hardened Boxes.

Berkshire.



This Axle is our Improved Collinge Collar, having wide washer bearings and large oil chambers at *each end* of box, also increased diameter of arm for safety. The finest axle in the world for Station Wagons, Spider Phaetons, Rockaways and all vehicles of moderate weight. Fitted only with Solid Wrought Iron Case Hardened Boxes. Sizes, 1 in., 1 1-16 in., 1 1-8 in., 1 3-16 in., 1 1-4 in.

Dalzell's Improved Collinge.



The merits of this Axle are well known, as it has been used continuously for fifteen years by many prominent builders of fine coach work.

Killam Double Spring Washer.



The most expensive axle manufactured, but the most popular with those who have had a practical experience in its use. No adjustment of nuts or D's and no replacing worn out leather washers ever required. Fitted only with our Wrought Iron Case Hardened Boxes and perfectly adjusted. The double spring takes up all end thrust and *very much* reduces the strain on the wheels.

SPRINGS AND AXLES.

"OPEN HEADS," Either Plain or Rubber Bushed.



Capacity, 150,000 Sets Axles; 3,000 Tons Springs per annum.

ANY STYLE WITH "FELT PAD," SELF-LUBRICATING.



"DUG OUT" COLLAR WITH "DOUBLE FLANGE" BOX.

THE HESS SPRING & AXLE CO., CARTHAGE, OHIO.

THE SCRANTON AXLE WORKS,
SCRANTON, PA.

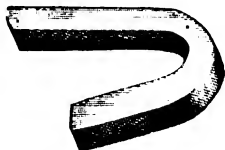
Manufacturers of

FINE VEHICLE AXLES

of Every Description.

OUR O. V. B. CONCORD EXPRESS is the best in the market.

We have sold in Chicago alone over 10,000 sets in four years of "OUR VERY BEST" Concord Axles, and not one complaint.



Axle Steel, lap welded and bent in weld.



Tire Steel, welded and bent in weld.

WELDING COMPOUNDS.

"CHERRY HEAT."

ONLY Welding Compound awarded MEDAL and Diploma at Chicago Exposition, 1893.

"EUREKA."

A New and Valuable Compound. RELIABLE. ECONOMICAL.

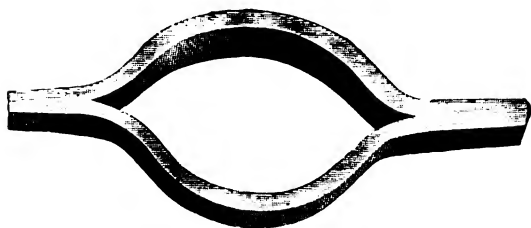
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THE WELDING COMPOUND CO.

Only firm granted a GOLD MEDAL (highest award) at Omaha Exposition just closed.

SEND FOR FREE SAMPLES, CIRCULARS, AND PRICE LISTS.

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Anvil Steel, welded at ends and forced open after welding.

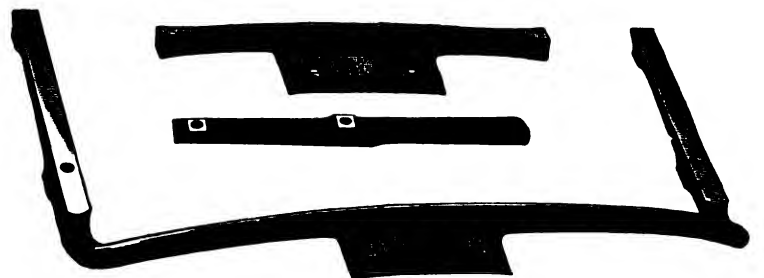
THE M. SEWARD & SON CO.,

MANUFACTURERS OF

**CARRIAGE
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SEND FOR
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HARDWARE.



Patented Dec. 9, 1897.

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NEW HAVEN, CONN.

Be sure to give widths out to out and drops wanted.

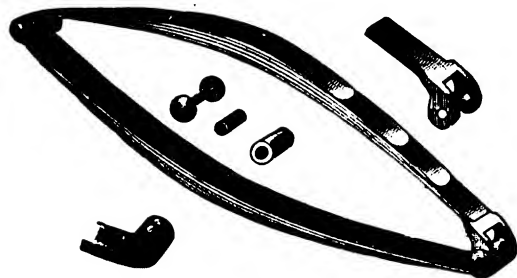
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Elliptic and Coach Platform Springs

WITH RUBBER OPEN-HEADS.

LARGE SIZE.—Designed for Broughams, Landaus and Coaches.

SMALL SIZE.—Designed for Buggies and Light Carriages.



The Rubber Open-Head

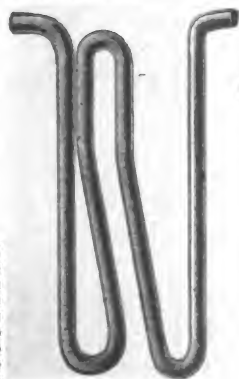
SPRINGS

Work Freely Without Friction.

No Binding or Squeaking in the Heads or Eyes.

Springs of Every Style and Pattern to order,
ALSO CURTAIN ROLLERS and CONCEALED HINGES.
Exclusively First-Class Work.—The Best that Can be Made.

SPRING PERCH CO.,
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IMPROVED POLE SPRING.



BRAKE SPRING.

WE CARRY EIGHT SIZES POLE AND BRAKE SPRINGS IN STOCK.

GET OUR CIRCULARS GIVING DIMENSIONS.

SPRINGS FOR ALL KINDS OF MACHINERY
MADE TO ORDER.

RAYMOND MFG. CO., Ltd.,

CORRY, PA.

This anti-rattler drives in or out in an instant, but never comes out accidentally. The best Wire Drive Anti-rattler made.

.....FIRST MADE IN AMERICA.....

“HAY-BUDDEN,” SOLID WROUGHT ANVILS.



MADE OF Best AMERICAN Wrought Iron,

Best AMERICAN Cast Steel.

FORGED BY Best AMERICAN Workmen.

Experience has proven their worth and demonstrated that Anvils can now be made in this country Superior in Quality, Form and Finish to any imported.

FULLY WARRANTED.

SEND FOR DESCRIPTIVE CIRCULAR.

HAY-BUDDEN MFG. CO., 254-278 NORTH HENRY STREET,
BROOKLYN, N. Y.

Received Gold Medal, Highest Award for Anvils at Omaha Exposition, 1898.

HAVE YOU ANYTHING NEW

that you desire to bring to the attention of the trade? Now is your opportunity to push it. Manufacturers are already beginning to order such devices as will make their vehicles more up to date and better sellers. Perhaps yours is just the article they are looking for. Let us help you. Request will bring rates.

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Q. Why should I use the Dayton Fifth Wheel?

A. You should not unless you build Pleasure Vehicles and aim to keep abreast of the times.

Q. Granted all that, what are its advantages?

A. The first Malleable Iron Fifth Wheel to be attached to a finished axle cap, it has every advantage possessed by imitators, while they have none it does not possess.

Q. What more?

A. Write to the Dayton Malleable Iron Company at Dayton, Ohio, and learn more.




THE NIELSON Roller-Bearing Fifth Wheel

Is the only PERFECTED and PRACTICAL ROLLER-BEARING FIFTH WHEEL on the Market to-day.

HAS NO EQUAL.

DON'T BE FOOLED.



WHY THE NIELSON IS THE BEST.

It is the product of a practical wagon builder, who has made a careful study of his trade and the necessity of developing something new in the way of a fifth wheel that would overcome the friction caused by the old circle in use on all kinds of platform vehicles. The present fifth wheel is the outcome of years of experiment, and contains all the good features lacking on other fifth wheels. The rollers, while an important part of the Nielson patent, without the other features would be as worthless as some others that are offered as "the best."

Don't let anybody tell you that So and So's Roller Bearing Fifth Wheel is just as good as the Nielson.

Roller-bearings, like ball-bearings, to prove of value must be properly housed. This is one of the greatest practical points on the Nielson, as it is constructed so that neither dust nor the elements to which fifth wheels are subject can affect the rollers.

As the rollers overcome all friction, the use of oil, grease or other lubricants is obviated, and thus when 'once the Nielson is attached to a vehicle the user need give this part of the vehicle no further thought, as it will outlast any vehicle. It always works easy and never gets out of order. No worry about broken shafts or poles, as the Nielson turns easily under the heaviest load. It is a godsend to dray horses as well as to the users of vehicles for mercantile purposes, as the Nielson not only saves the horses but prolongs the life of the vehicle.

YOU WANT THE BEST.

GET THE NIELSON.

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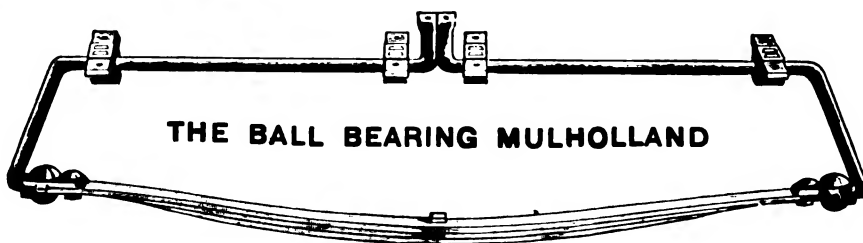
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That Have Stood
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Hundreds of Thousands of them
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WE MANUFACTURE HIGH GRADE VEHICLES IN THE WHITE.

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MULHOLLAND SPRING AND GEAR CO.,
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THE "TRACER" TELLS.

THE "TRACER" TELLS Isn't it worth your while to learn what other Wholesale merchants know about Retailers who seek credit from you? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth your while to learn from other Wholesale merchants what record your would-be customer has made with them? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth your while to be able to ask several thousand merchants everywhere what they know about a man you want to know about? The "Tracer" tells.

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THE "TRACER" TELLS Isn't it worth while to learn your customers' inside business history, not from outside guesses, but from inside records; the actual experience of those who have dealt with them? To learn those things that determine character and business ability as well as financial strength? The things that make you trust or distrust a man? The things that come up in actual business dealings, but which an outsider cannot know? The "Tracer" tells.

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THE "TRACER" TELLS and it is the only thing that tells. Every business man leaves a record, widely scattered in the ledgers and in the minds of merchants far apart. That record, if gathered, is the best proof of what a man actually is, in his business relations. The "Tracer" gathers these scattered leaves and makes the record complete. The "Tracer" goes to thousands of Wholesale merchants everywhere. From them come a dozen detached bits of experience, concerning one man: together they show his whole business past, and his present condition. Has he ever bought? The "Tracer" tells. Is he getting slow? The "Tracer" tells. Is it time for caution? The "Tracer" tells.

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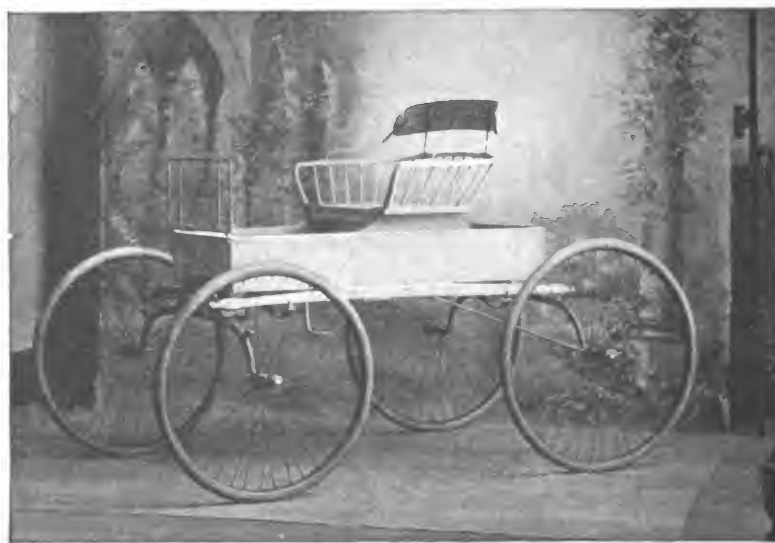
A FULL LINE OF
Carriage Forgings
....AND....
Special Drop Forgings.



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AUBURN, N. Y.

THE PREMIER WAGON



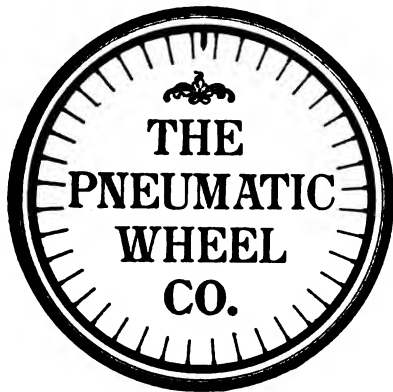
WE ARE PREPARED to furnish the trade with the Premier Wagon, (in the WOOD AND IRON only) ready to paint and trim. We have them for one and two passengers, and with 17 x 52 inch and 22 x 54 inch bodies respectively. The one-passenger job weighs 102½ pounds, while the two-passenger job weighs about 147 pounds.

The one-man job has Timken springs, is a substantial road wagon, and is light enough for speeding. The two passenger job is a first-class business or road wagon, rides as easy as an end spring job, and weighs from 100 to 150 pounds less than the ordinary two-passenger job.



PREMIER MFG. CO.,

Hartford, Conn.



MANUFACTURERS,
YOUR 1900 PNEUMATIC WORK WILL

*Look Better,
Wear Better,
Ride Better,
Give Better Satisfaction,
and Bring Better Prices if*

FITTED WITH OUR PNEUMATIC WHEELS.

SIMPLEST, BEST AND STRONGEST.

BE A LITTLE AHEAD OF THE TIMES. USE OUR WHEELS.

THE PNEUMATIC WHEEL CO.

FREEHOLD, NEW JERSEY, U. S. A.

SULKY...BUGGY
SURREY

ESTABLISHED 1854

TRAP...SPEEDER
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WIRE WHEELS
WESTON-MOTT CO
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**12 Styles Gear Sets
for Carriages**

**3 Styles Steering Axles
for Motor Carriages**



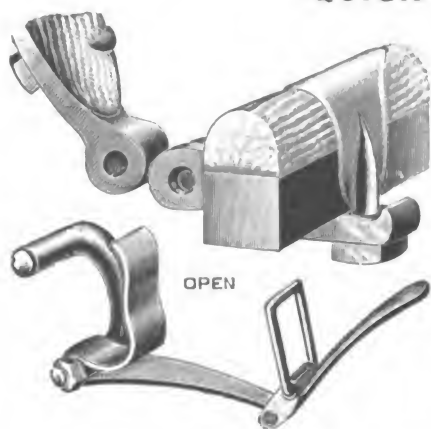
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of all descriptions, high grade ball bearings with a perfect adjusting device. Light and durable. "Fastest" wheel on the market. Fully prepared to furnish all sizes and designs. Send for catalogue.

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QUICK SHIFTER AND ANTI-RATTLER.



OPEN

JUST WHAT YOU WANT.

SAFETY COMBINED WITH UTILITY,
RAPIDITY and SIMPLICITY.

PATENTED MARCH, 1899.

The Safest, the Strongest, the Neatest
and the Best Quick Shifting Coupler and
Anti-Rattler ever offered on the market,
for the following reasons:



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1. BECAUSE It is used with common draw shackles.
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3. BECAUSE It has the strongest steel bolt, being one continuous piece, holding the shaft eye and spring with riveted nut.
4. BECAUSE the clip tie has a hook to prevent the lever from becoming detached.
5. BECAUSE the lever curves upward, avoiding all possibility of catching obstructions.
6. BECAUSE all parts are made of the Best Materials, Thoroughly Tested and Guaranteed.

It is not claimed to be the cheapest Coupler and Anti-Rattler on the market, but it IS the cheapest when Safety, Reliability and Durability are taken into consideration.

It cannot come loose. See the hook on clip tie. Clip ties are furnished free with every pair of the Empire State Anti-Rattler. Made in buggy and surrey sizes. Special prices to jobbers and large manufacturers. Write for quotations at once, as the "Empire State" would prove a strong selling point for your vehicles.

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UTICA, N. Y.**



Axle Steel,
lap welded and bent
in weld.



Tire Steel,
welded and bent
in weld.

WELDING COMPOUNDS:

"CHERRY HEAT."

ONLY Welding Compound awarded
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A New and Valuable Compound.
RELIABLE.
ECONOMICAL.

MANUFACTURED ONLY BY

THE WELDING COMPOUND CO.

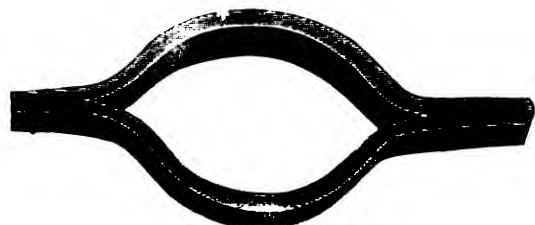
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Anvil Steel, welded at ends and forced open after welding.

BAILEY'S BULL DOGS!



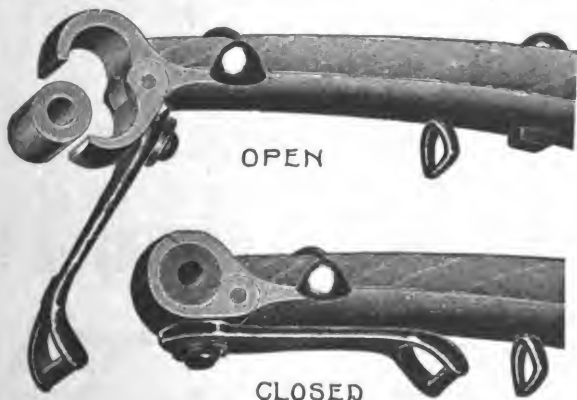
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It is Silent, Sure, Simple, Strong,
Quick-Shifting, and as Safe as a
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the dealers.

DEALERS SAY it helps sell vehicles to
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WE WOULD LIKE TO WRITE YOU FULL PARTICULARS.
MENTION THIS JOURNAL AND WE WILL SEND YOU OUR
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AMESBURY, MASS.

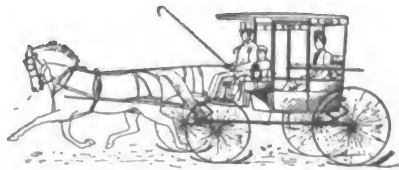


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75 CENTS EACH.

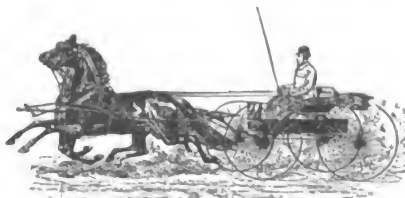
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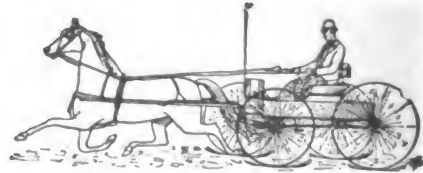
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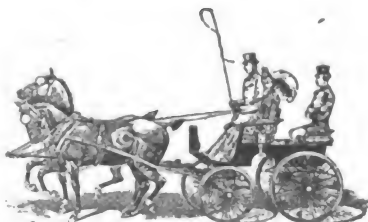
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No. 506.



No. 507.



No. 508.



No. 509.



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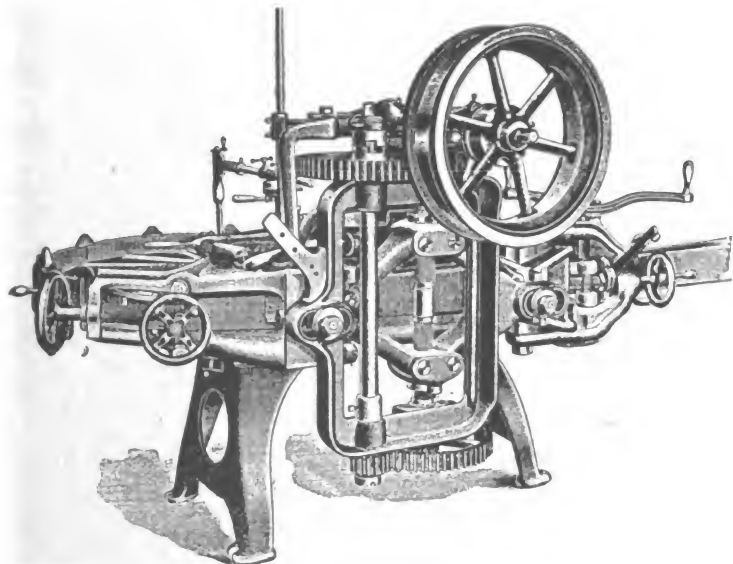
TRADE NEWS PUBLISHING CO.,

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HAND AND POWER MACHINES



TO SUPPLY THE DEMANDS OF THE
CARRIAGE AND WHEEL TRADE, AND ALSO THE BLACK-
SMITH AND GENERAL REPAIRER.

A power machine with an automatic attachment, and where the operator has absolute control of the machine; can stop or start it instantly at any point in its operation.

Simple in construction. Powerful in operation. Reasonable in price. Does its work thoroughly, accurately and rapidly, giving proper and uniform dish to wheels.

THE NEW MODEL McGOVERN COLD TIRE SETTING MACHINE with its increased capacity, simplicity and strength, all three points being more than tripled in this new machine, we guarantee to set Tires ranging from $\frac{3}{4}$ inch to $2\frac{1}{2}$ inch \times $\frac{3}{4}$ inch. Our daily capacity from 800 to 1,000 wheels.

NOTICE.—We now offer old model hand and power machines at a low figure.

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LIME ROCK, CONN.**

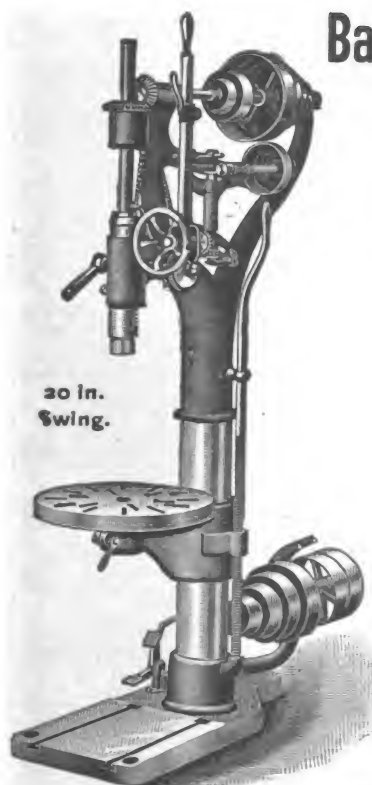
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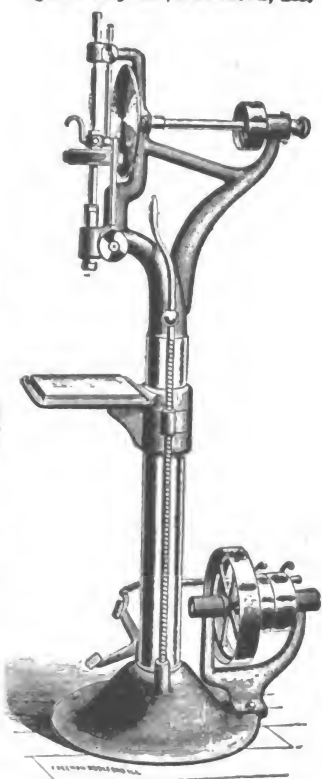
Single, Back Geared,
Multiple, Sliding Head,
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Power Feed, Worm Feed,
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W. F. & Jno. Barnes Co.,
588 Ruby St., Rockford, Ill.



30 in.
Swing.



BARNES' New Friction Disk Drill.

FOR LIGHT WORK.
Has these Great Advantages:

The speed can be instantly changed from 6 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage. Send for catalogue.

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PATENT ROLLER OR WEAR IRONS

FOR CARRIAGES, RUBBER-TIRED VEHICLES,
LUMBER, DELIVERY AND FARM WAGONS.

FAR SUPERIOR TO ANY OTHER ON THE MARKET FOR THE FOLLOWING REASONS.

FIRST—They *always* roll and *never* rattle, being made with adjustable set screws, and can be affixed to a carriage or wagon in a few minutes by any person.

SECOND—They never break, because they are made from best malleable iron and hardened steel.

THIRD—*Impossible* to upset any vehicle which has these Wear Irons on.

FOURTH—It will save a pair of tires a year.

F. J. MARLEY & CO.,

SOLE MANUFACTURERS,

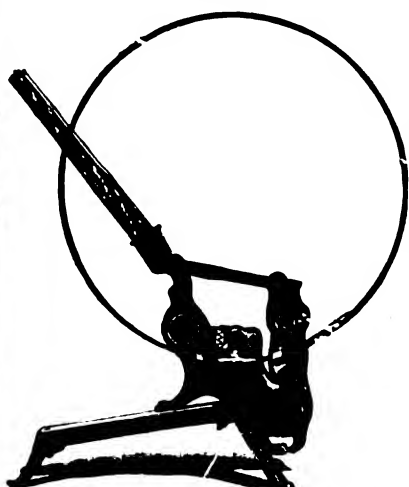
—LITTLE FALLS, N. J.

White's Adjustable Patent Brake.



Write for circular
and price to
GEO. WHITE,
Rock Island, Ill.

THE IDEAL TIRE UPSETTER.



The advantages of the Ideal are:

The tire cannot kink.
One man can operate it.
One movement does the work.

It will shrink light Buggy tire.

It will shrink Heavy Wagon tire.

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It will shrink perfectly all kinds and thicknesses of tire.

It is the easiest handled.

It is the most durable.

It is the latest and best.

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Manufactured only by

WEYBURN & BRIGGS CO., 718 Main St., Rockford, Ill., U. S. A.

Covert's Leather Centers

TAKE THE LEAD.

BEWARE of Metal Centers put together with rivets and bolts as the wear on them is out of sight, and therefore liable to give way when you least expect. Be on the safe side and use all **Leather**, which is plain to be seen when unsafe to use.



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ESTABLISHED 1850

DEFIANCE MACHINE WORKS

DEFIANCE, OHIO, U. S. A.

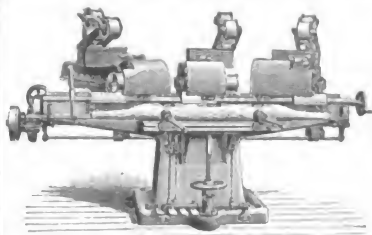
INVENTORS AND BUILDERS OF

**PATENT LABOR-SAVING
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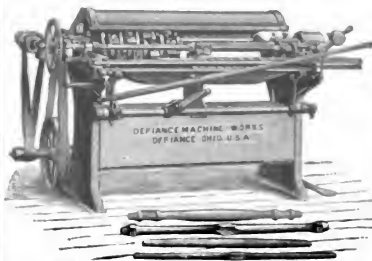
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**Hubs, Spokes, Wheels, Wagons, Carriages, Rims, Shafts, Poles,
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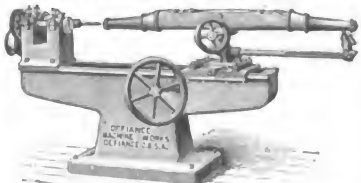
EUROPEAN OFFICE, 16 ELDON STREET, LONDON, E. C. ENGLAND.



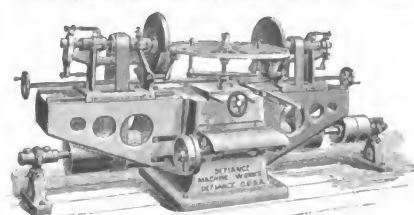
PATENT TRIPLE GAINER.



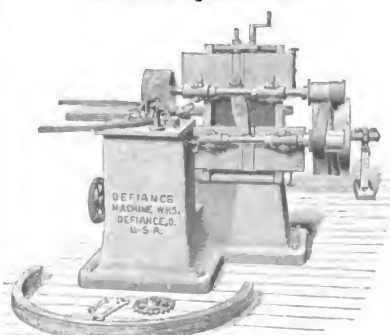
NECK-YOKE AND SINGLE-TREE LATHE.



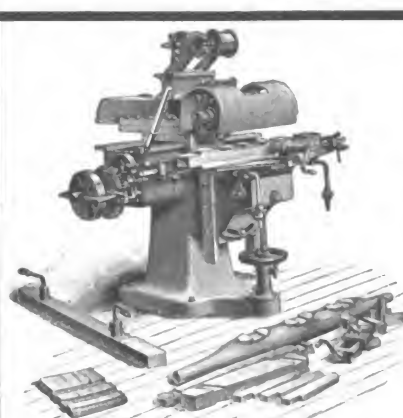
LAG SCREW BORING AND DRIVING MACHINE.



DOUBLE DISC TREAD SANDER.



DOUBLE DRUM RIM SANDER.



SINGLE HEAD GAINING MACHINE.

smallest sizes up to 8 inches wide, 3 inches deep, and from 1 inch to 24 inches long and perform the work true and smooth, without slivering.

THE CUTTER HEADS are made in halves and can be expanded almost instantly for cutting different widths of gains.

THE SLIDING RAM is operated by friction feed and has a quick return motion. It can be retreated at any position of the cut and can be set at any angle desired.

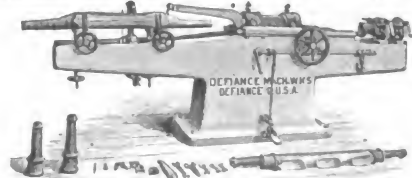
THE TABLE is adjustable for any bevels and can be quickly changed for any depth of cut.

THE ATTACHMENT shown at base of machine is used for centering wagon axles when cutting hound and reach gains. 12 to 24 wagon stakes can be finished complete at one operation.

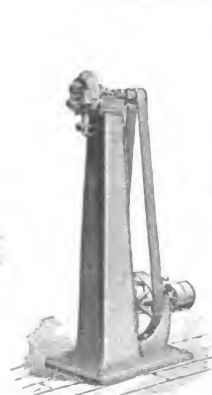
THIS ENGRAVING represents our Patent Single Head Gaining Machine, especially designed for Wagon, Truck, Carriage, Agricultural Implement Manufacturers and General Wood Workers, for cutting gains, grooves, tenons and miters, either square, angular, or double angular, in either hard or soft wood.

IT WILL CUT

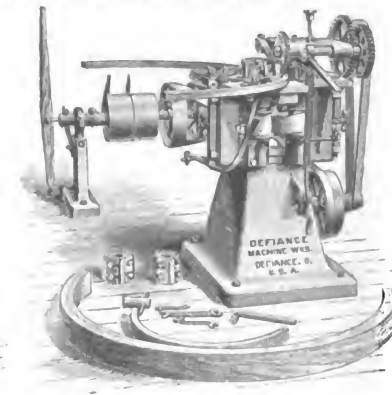
GAINS from the



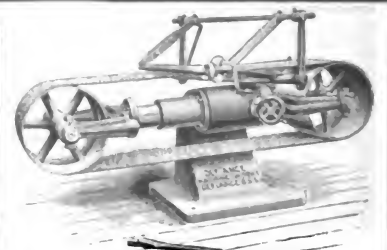
AUTOMATIC SKEIN SETTING AND FITTING MACHINE.



RIM ROUNDER.



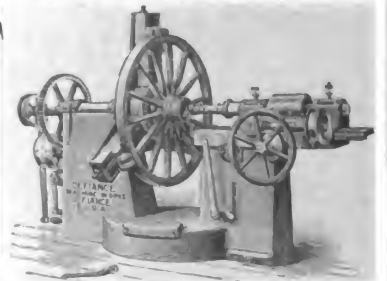
No. 1 TWO-SIDE RIM PLANER.



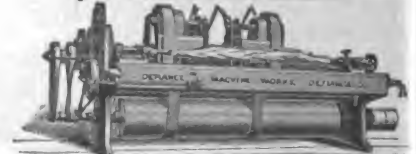
PATENT IRON FRAME SAND BELT.



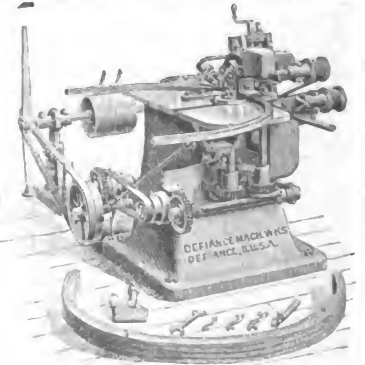
TIRE SETTING AND COOLING MACHINE.



No. 2 WHEEL BOXING MACHINE.



DOUBLE HEAD AXLE TURNING LATHE.



No. 2 TWO-SIDE RIM PLANER.

Please mention "The Hub" when you write.

Improved Automatic Axle Gaining Machine. Felly Cut-Off, Boring & Dowelling Machine. No. 2 Wheel Polisher. Improved Gear Rounding Machine, With Jointing Attachment.

IMPROVED WHEEL, HUB-BORING AND BOXING MACHINE. B&M CO.

THE BENTAL & MARGEDANT COMPANY.
MANUFACTURERS OF
WOOD WORKING MACHINERY.
HAMILTON, O., U.S.A.

HEAVY GIANT WHEEL TENONER. B&M CO.

Hub Band Grinding and Polishing Machine. B&M CO. Top of Felly-Rounding Machine. Improved Cam Press. Hydrostatic Wheel Press. Vertical Six Spindle Gang Boring Machine.

IMPROVED AND PATENTED

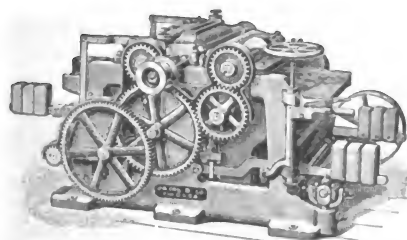
Wood-Working Machinery

OF EVERY DESCRIPTION.

A Full Line of Machines for Wagon, Carriage, Buggy, Wheel,
Spoke, Handle and Wood-Working Establishments Generally.

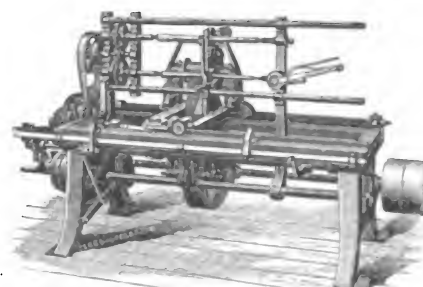
... Investigate These Two Machines ...

✦
Variable Feed.
Bed raises and
lowers on long in-
clines.
We make 5 sizes,
to plane
24, 26, 30, 36 and 42
inches wide and
six inches thick.



NEW No. 19 SINGLE CYLINDER CABINET
SMOOTHING PLANER.
PATENTED FEBRUARY 6th, 1900.

It's
Worth
Your
While.



NEW No. 2 AUTOMATIC SPOKE LATHE,
WITH PATENT AUTOMATIC LIFT TO
VIBRATING FRAME.

Particulars and prices
on application to

J. A. Fay & Co.,

531 to 551 West Front St.

CINCINNATI, O.

Please mention "The Hub" when you write.

"Silver's" New Band Saws for CARRIAGE MAKERS, WAGON MAKERS AND WOOD SHOPS OF EVERY KIND.

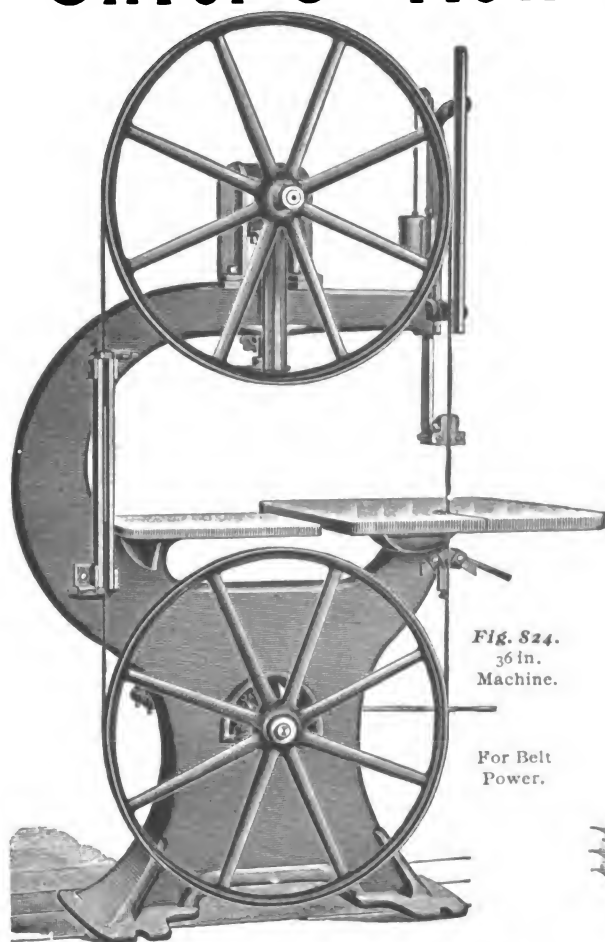


Fig. 824.
36 in.
Machine.

For Belt
Power.

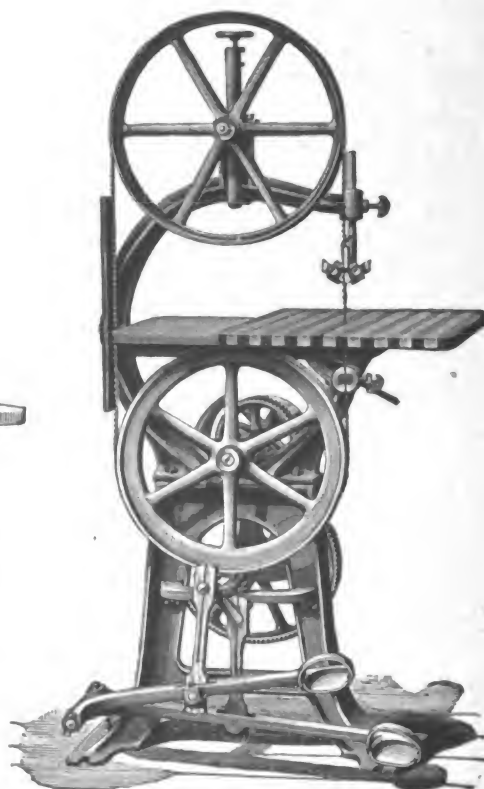


Fig. 721.

30 in. Machine. Combined Foot or Belt Power.

IN SIZES:

20 in. machine for foot or belt power.
24 in. machine for foot or belt power.
32 in. machine for belt power.
36 in. machine for belt power.

LIST PRICES,

\$50.00 to \$130.00.

Special Discount to Carriage
and Wagon Makers.

These machines are symmetrical and modern in design, and absolutely rigid and strong for the heaviest work coming within the range of each machine.

Ask for 1899 12 page
Circular showing all
sizes.

Manufacturers also of "DOLE'S"
and "SILVER'S" HUB BORING MA-
CHINES, "DOLE & DEMING" SPOKE
TENON MACHINE, "SILVER'S" and
"ADVANCE" DRILLS, Etc., Etc.

EVERY MACHINE GUARANTEED.

THE SILVER MFG. CO.

339 Broadway,

SALEM, OHIO, U. S. A.

LABOR-SAVING MACHINERY

... OF ALL KINDS FOR...

PUNCHING,

SHEARING,

TIRE WELDING,

BENDING AND

FORMING,

: ...FOR...

Carriage Shops

Wagon Works, Etc., Etc.

DESIGNED AND MANUFACTURED BY

THE LONG & ALLSTATTER CO.

HAMILTON, OHIO, U. S. A.

...Also make Machinery...

FOR

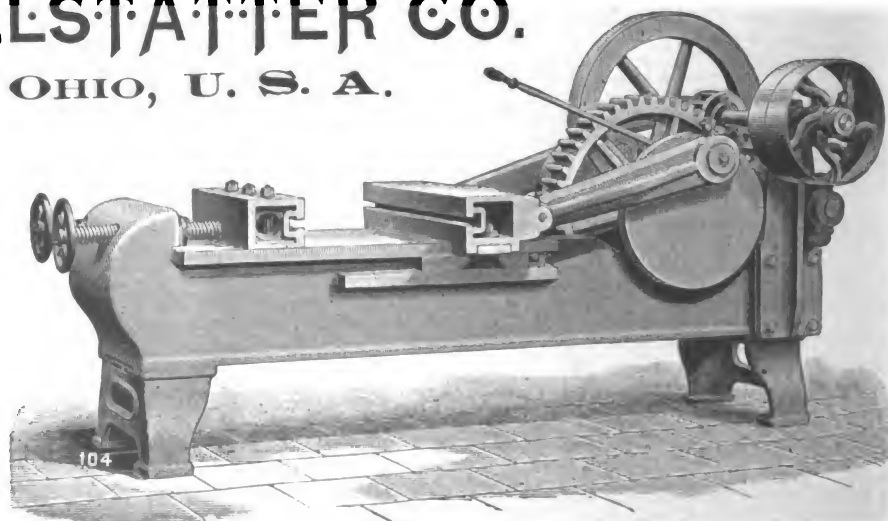
**ROLLING MILLS,
STRUCTURAL IRON WORKS,
RAILROAD SHOPS,
BOILER WORKS,
BRIDGE WORKS, Etc., Etc.**



If Interested write for Catalogue.



CORRESPONDENCE SOLICITED.

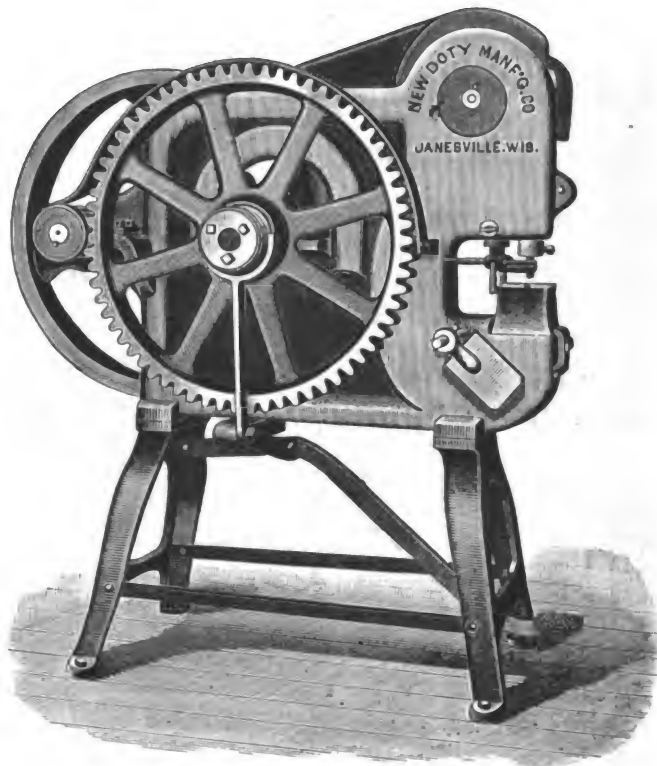


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PUNCHING MACHINE.



WE illustrate herewith a machine adapted to punch holes up to $\frac{3}{4}$ inch diameter in iron or steel $\frac{1}{2}$ inch thick, or equivalent work. The body or frame of the machine is cast in a single piece, and the boxes for the shafts cast with it, and this principle of casting and forging as many parts in one as possible is carried out all through the machine, to secure strength and rigidity. The clutch is so arranged as to be convenient to operate, and is quick, positive and quiet. By it the punch can be

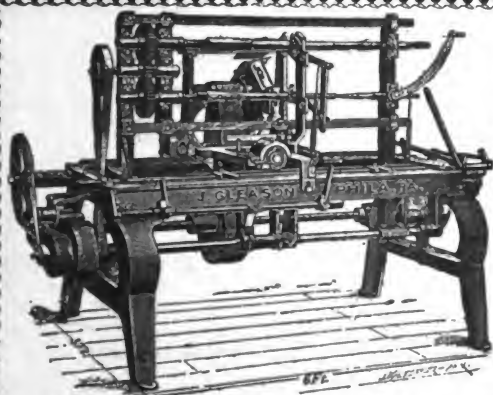


stopped at any part of its stroke, either up or down. The machine has an improved tripper, which can readily be adjusted, and as nicely or accurately as may be required for any work. All necessary gauges and gauge rods are also supplied. Tight and loose pulleys form a part of the machine, so that when it is placed in position it is ready to run. The machines are made in six sizes by the New Doty Manufacturing Company, Janesville, Wis.



No. 16 C. PUNCHING MACHINE.

NEW DOTY MANUFACTURING CO., JANESVILLE, WIS.



GLEASON'S NEW IMPROVED AUTOMATIC SPOKE AND HANDLE LATHES.

GLEASON SPOKE LATHE and MACHINERY CO.

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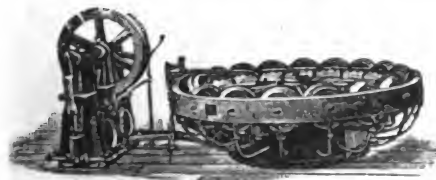
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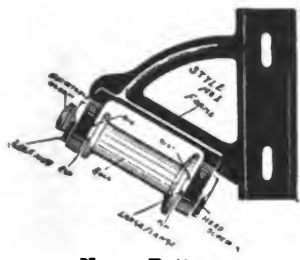
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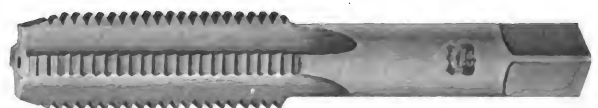
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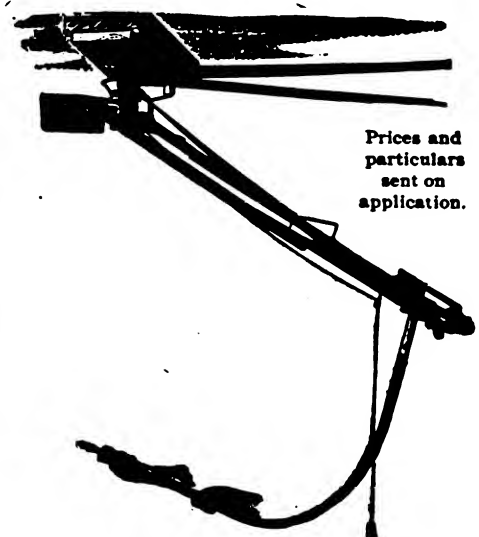
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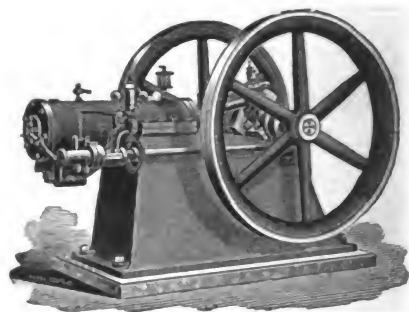
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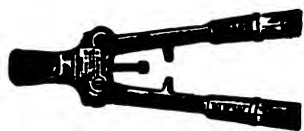
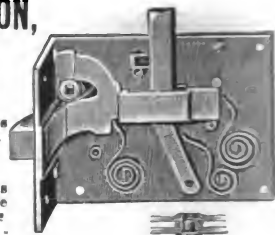
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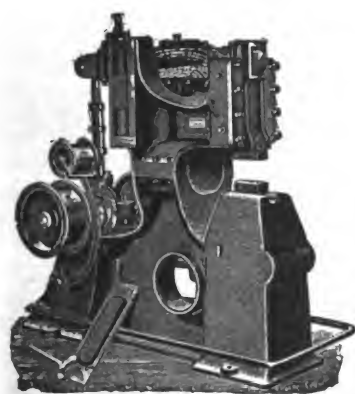
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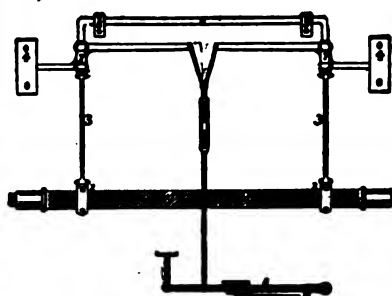
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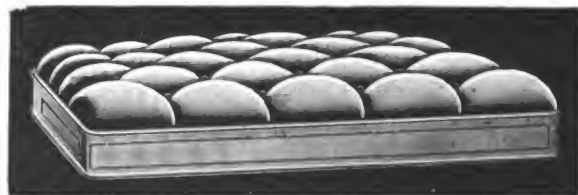
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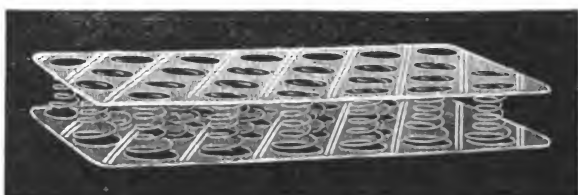
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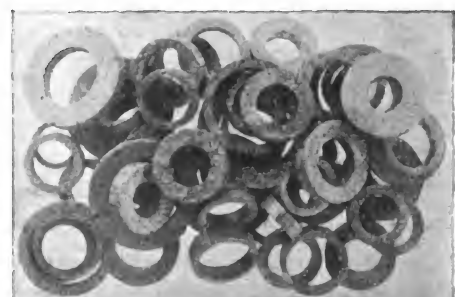
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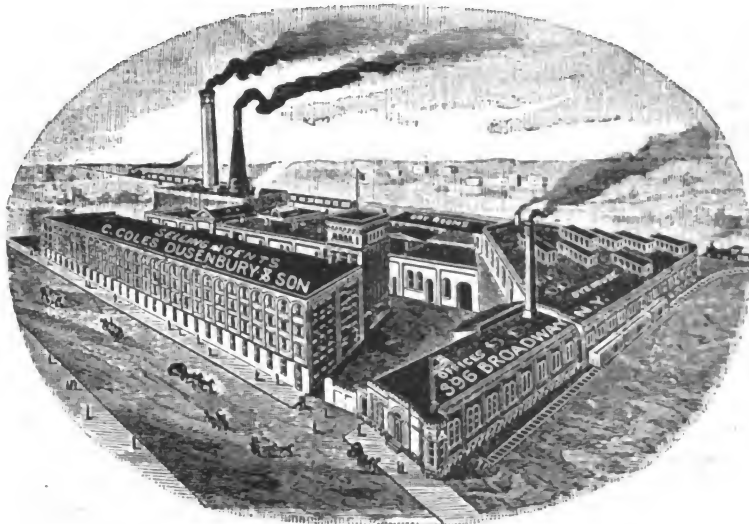
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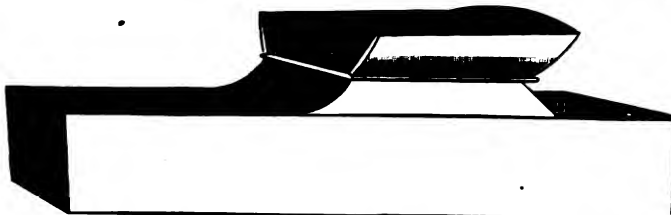
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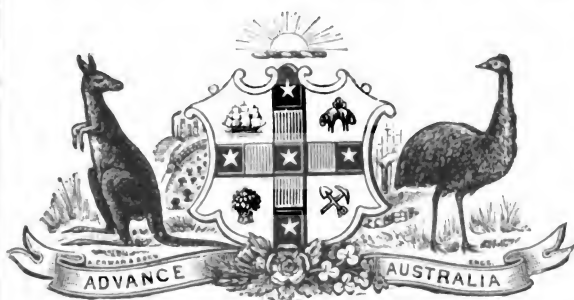
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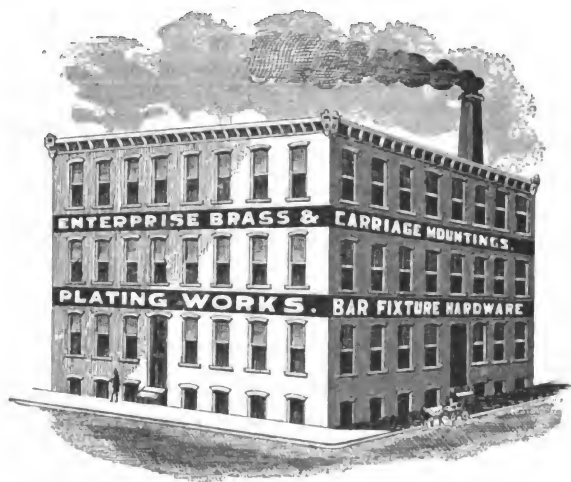
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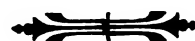
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Spring and Gears.
Detroit Spring & Steel Co., Detroit.

Dexter Spring & Gear Co., Pittsburgh, Pa.

Fitch Gear Co., Rome, N. Y.

Galton (O.) Wagon and Gear Co.

Hess Spring & Axle Co., Carthage, O.

Wm. F. Kramer, Dayton, O.

E. R. Merrill Spring Co., New York.

Muholland Spring & Gear Co., Dunkirk, N. Y.

Pell Gear Works, Rome, N. Y.

Wm. & Harvey Rowland, Philadelphia, Pa.

Raymond Mfg. Co., Cory, Pa.

J. B. West, Rochester, N. Y.

Tire Up-Setters.
Weyburn & Briggs Co., Rockford, Ill.

Toilet Cases.
English & Mersick Co., The, New Haven, Conn.

Tops, Carriage.
C. A. Halliday, Oneida, N. Y.

Falls City Buggy Top Co., Louisville, Ky.

Initial Toe Pad Co., Three Rivers, Mich.

Shelter Top Co., St. Louis, Mo.

Transfer Ornaments.
Meyercord Co., The, Chicago, Ill.

Palm, Fechteler & Co., New York.

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Atwood Mfg. Co., Amesbury, Mass.

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Cincinnati (O.) Carriage Goods Co.

Cortland (N. Y.) Carriage Goods Co.

G. E. Daniels & Son, New York.

C. Coles Dusenbury & Son, New York.

Enterprise Brass & Plating Works, Cincinnati, O.

Fairfield (Conn.) Rubber Co.

Hardt, Von Bernuth Co., New York.

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G. H. Lounsbury & Sons, Cincinnati, O.

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Pantastote Co., New York.

Raritan Woolen Mills, New York.

F. J. Schmid, New York.

Searls Mfg. Co., Newark, N. J.

Somerset Mfg. Co., New York.

Staples & Hanford, Newburgh, N. Y.

Stearns & Foster, Cincinnati, O.

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Cortland Welding Compound Co., Cortland, N. Y.

Welding Compound Co., Paterson, N. J.

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For all kinds of delivery wagons.
Manufactured in one grade only—

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November 19-24-1900

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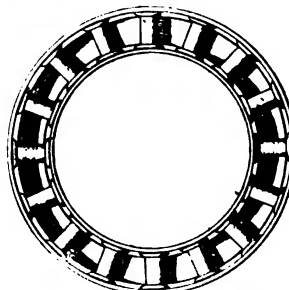
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The Hub

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FOR
VEHICLES.



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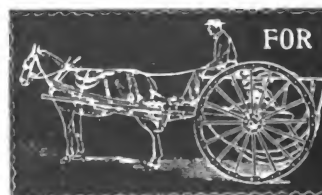
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**SAVES: 25 Per Cent. on Cost.
50 Per Cent. on Application.**

These are saved over other Patent fifth wheels by using **The Bradshaw Spool-Roller 5th Wheel.**
To fit these Spool Rollers to old wagons, the removal of the old wheel is not necessary. This wheel is 100% more durable than any other patent 5th wheel.
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The Hub

87



Trade-Mark.

WHEELS

**LIGHT
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Capacity 250 Sets Per Day.



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FOR SUPERIORITY IN CONSTRUCTION, WORKMANSHIP AND MATERIAL.

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Established
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CARRIAGE LININGS.

Established
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HARDT, VON BERNUTH & CO., 477-481 Broome St., New York.

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Did Your Wife Spoil Her Bonnet

When she was out driving and was overtaken by a heavy shower?

If the top had been fitted with Cately's Buggy Prop Springs and Levers, she could have raised the heavy top and saved all that loss.

Think of your wife's convenience when you order your buggy and see that it has these attachments.

Vehicle manufacturers will put them on YOUR buggies, if you will but request it in your order.

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CATELY & ETTLING,
Cortland, N. Y.

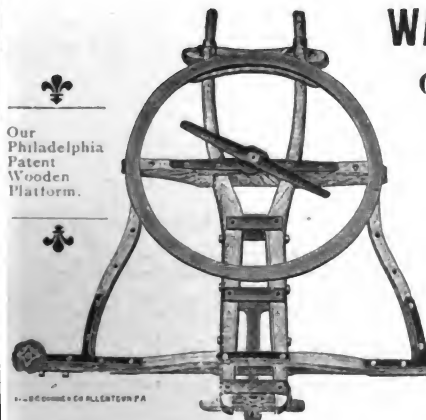
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Of Iron, Steel
or Wood.

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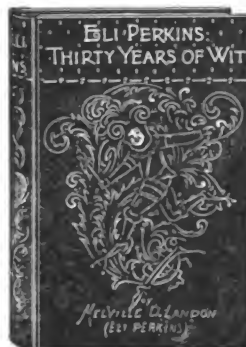
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PLATFORM CO.**
ALLENTOWN,
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Our
Philadelphia
Patent
Wooden
Platform.

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This book contains the Best Anecdotes, the Best Wit and Humor and the Brightest Sayings of the 19th century. This volume amuses every reader. It contains mirth on every page and laughter in every line. This treasurehouse of gladness contains General Sherman's Anecdotes and Jokes, Chauncy Depew's Best Stories, a night with the jolly rebels, Bill Nye in Laramie, Wild West Exaggerations, Doctors' Wit and Humor, Eli with the Lawyers, Henry Ward Beecher's Humor, etc., etc. This magnificent book is bound in English cloth with special cover design in gold and ink, size 6 1/2 x 7 1/2 and contains 306 pages. Sent postpaid on receipt of our Special Offer Price, 85 Cents. One of these books should be in every home. Send for our Special Illustrated Book Catalogue, FREE. Address all orders to

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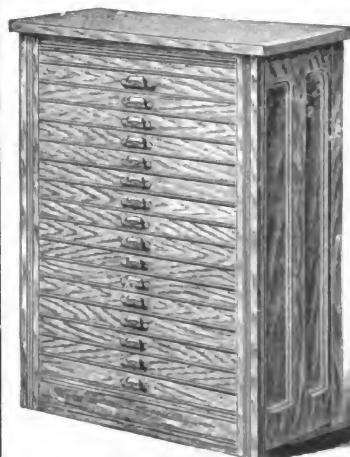
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For Iron and
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Various Styles
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THE.... HIGGIN

Quick Shifter and
Anti-Rattler. • •
Adjustable Cur-
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Hub Band Shells
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Dust Caps. • • •

If you don't know,
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WHY, you can get
full description and
samples from the
manufacturers. •
This would con-
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trade knows good
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STAPLE AR-
TICLES. • • •
Don't be left out, but
send for catalogue.

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The Higgin Manufacturing Co.

NEWPORT, KY.

High Grade Wheels.

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Manufacturers of

Vehicle ...Wheels

of Every Description.

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COACH COLORS,
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SPECIALTIES.

C. T. RAYNOLDS & CO.'S {
COACH COLORS,
VARNISHES,
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SPECIALTIES.

For Painters, Artists and Decorators.

All the brands and specialties of F. W. DEVOE & Co. and C. T. RAYNOLDS & Co. will be maintained separately as heretofore.

Hartford Axle Company.

Good Axles are the result of experience, careful attention to smallest details, and the constant desire to improve. The continual upbuilding of our reputation has been guided by these principles, and a trial of our work will convince you of the excellence of our product. We make all styles, including the Brewer.

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Vo. 16. ... NARRATIVES ...

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Yours truly, C. A. WILSON.

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Makers of the Best Wheels on earth.

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FOR ALL UPHOLSTERING PURPOSES.

Is a material recognized as the only *Perfect Substitute for Leather*.
It will not *Crack, Scratch, Rot, Tear* or *Peel Off*.
Can be had in *Any Grain, Weight* or *Color*, to suit purchaser. Is *Waterproof*. Oilproof, Germproof, *Dustproof* and *Odorless*. Looks like Leather, wears like Leather, and costs about *one-third* as much.
Contains *No Rubber* or *Celluloid*.
Has a hard *Wearing* surface.

IF YOU WANT TO MEET YOUR COMPETITORS' PRICES AS WELL AS OBTAIN MOST SATISFACTORY RESULTS, DO NOT BE DECEIVED BY WORTHLESS IMITATIONS.

USE MOROCCOLINE,

Manufactured only by

BOSTON ARTIFICIAL LEATHER CO., 12 East 18th Street,
NEW YORK.
W. N DOLE, General Manager.

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You can make your own dashes and fenders if you want to, but you can't compete with us.

You can't make dashes of our high quality unless they cost you more than it would cost you to buy them from us.

What is the use of trying?

You know, of course, what an enormous percentage of all the dashes used in the United States are made in our big factories.

You know that we have every facility, every possible equipment, and that we consume a vast amount of leather.

These things enable us to make the finest quality of dashes and fenders from the very best material that money can buy, at prices which place us far and away beyond competition.

There is nothing that can be put into a dash to add to its quality or attractiveness that is lacking in our goods.

We cover them with the finest hand-buffed grain dash leather, never using machine-buffed leather in any of our work.

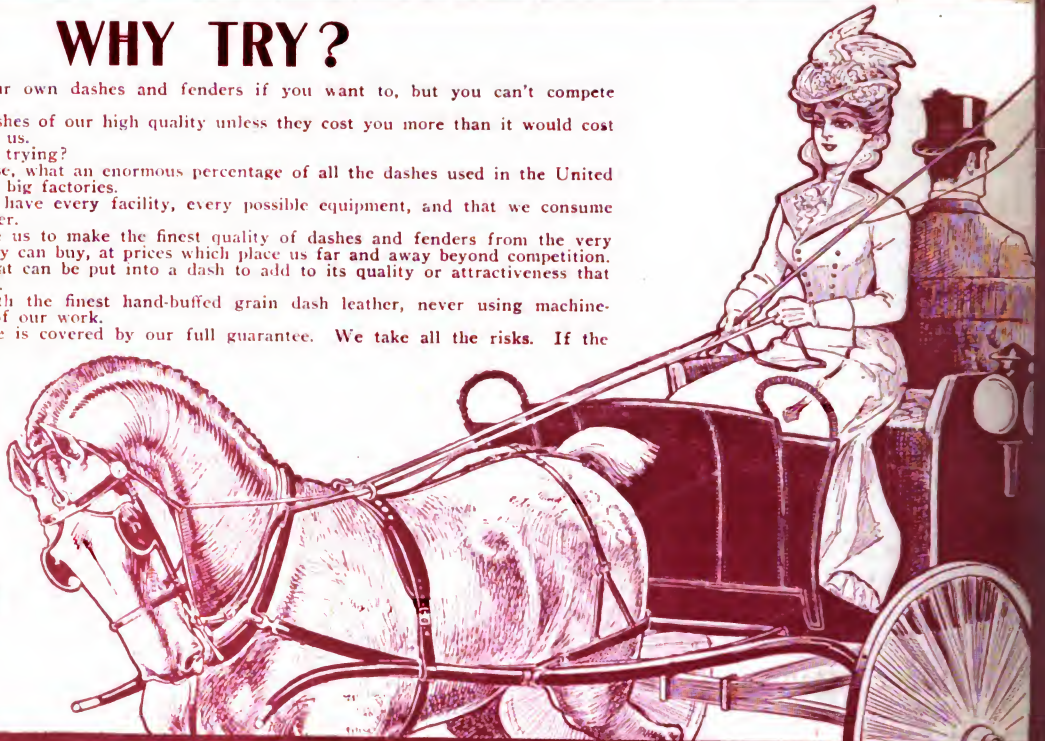
Everything we make is covered by our full guarantee. We take all the risks. If the leather cracks you are protected.

If there are flaws or imperfections of any kind, the loss is on us and not on you.

Every dash you use that is not a McKinnon Dash represents a certain money loss to you, and we do not suppose you are in business for the purpose of losing money.

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DASHES AND FENDERS ROLL-UP STRAPS AND WASHERS

Telephone Service at Your Residence

will add but a trifling amount to your expenses, but will add 100 per cent. to Your Comfort.

Rates in Manhattan
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BRASS, NICKEL, SILVER SIGNS.
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...FILLING...

Intended to take the place of tub lead in preparing running parts for the color and bodies for the Rough Stuff. It does away with the poisonous dust arising from lead. It should be used over one coat of our Priming on new work, or as a priming coat on old work or gears.

SPECIAL VARNISHES AND
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PAINTER.

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Varnish Makers and Color Grinders,
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Manufacturer of **WHEELS, RIMS, HUBS, SPOKES.**

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The Hub

JUNE

1900

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MANUFACTURERS AND DEALERS, AND THE ACCESSORY TRADES.



Vol. XLII.

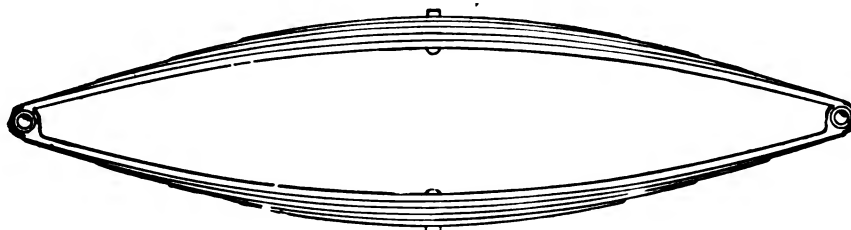
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Are you looking for better varnish?

Have you tried our fine coach varnishes?

They are superlatively fine and will insure entire satisfaction.

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*We can also interest you in our line of Coach Colors,
and invite your correspondence.*

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The latest and most satisfactory style of cuts. Manufacturers who have adopted our **IVORETTES** claim that they are enabled to give a better representation and bring out more prominently the striking and desirable features of their work. See THE HUB's Fashion Plates for samples.

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The Parrott Varnish Company,

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The Certainty of Good Results

GOOD results in carriage painting can be made absolutely certain by using **PERFECT METHOD**. You can be sure that every carriage you turn out is right—that it will wear right and look right.

PERFECT METHOD correctly used cannot go wrong. There is no risk about it.

All the materials used, from primer to finish, are pure beyond all doubt, and the coats are uniformly elastic.

We make all our own liquids and know they are always the same.

Our chemical and practical laboratories insure goods that are right in every way before they go out.

If you want this certainty and uniformity in your work and want to paint with the greatest durability, the greatest beauty, and the greatest economy, investigate **PERFECT METHOD**.



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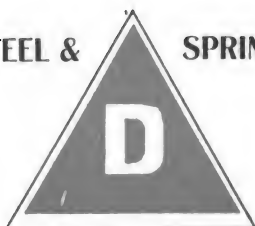
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PERFECT METHOD
OF
CARRIAGE
PAINTING.**



DETROIT STEEL & SPRING **COMPANY**

DETROIT,

MICH.

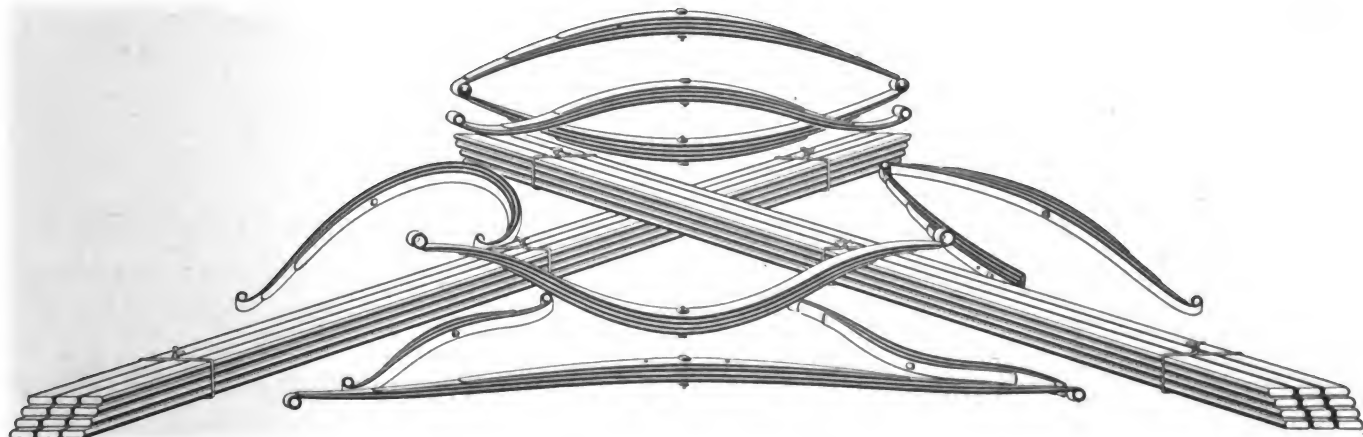


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**Soft Welding and
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**All Grades and Sizes
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STANDARD CARRIAGE VARNISHES

*Safe,
 Uniform,
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We Challenge a comparative test with
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A smooth even coat

Will Result From the Use of
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EXTRA WHITE LEAD,

REQUIRING SCARCELY ANY SANDPAPERING
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White Lead, Colors, Paints, Varnishes & Chemicals,
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A Good Black

at a low price is a very difficult
article to get. We have one in our

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put up in 5 or 10 pound press cans,
like cut, at

16cts. per pound, net.

Also Colors, Brushes, Pumice
Stone, Rubbing and Rotten Stone,
Sponges, Chamois, Rubbing Felts.

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We make
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of Brushes
for Carriage
and Wagon
Makers.



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Net Price List
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"RED SEAL" COACH AND CAR COLORS

ARE ABSOLUTELY THE FINEST MADE.



WE take pleasure in furnishing samples of the colors we make, so that the consumer may be convinced of the richness and tone of our colors before purchasing.



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WHY USE SANDPAPER?

1. When you can get the same results in just **ONE-HALF THE TIME** by using Steel Wool?
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USE
BUY
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STEEL WOOL.

It cuts more quickly and more uniformly than sandpaper, does not clog or "gum up," and adapts itself readily to the shape of carvings, mouldings, etc., etc.

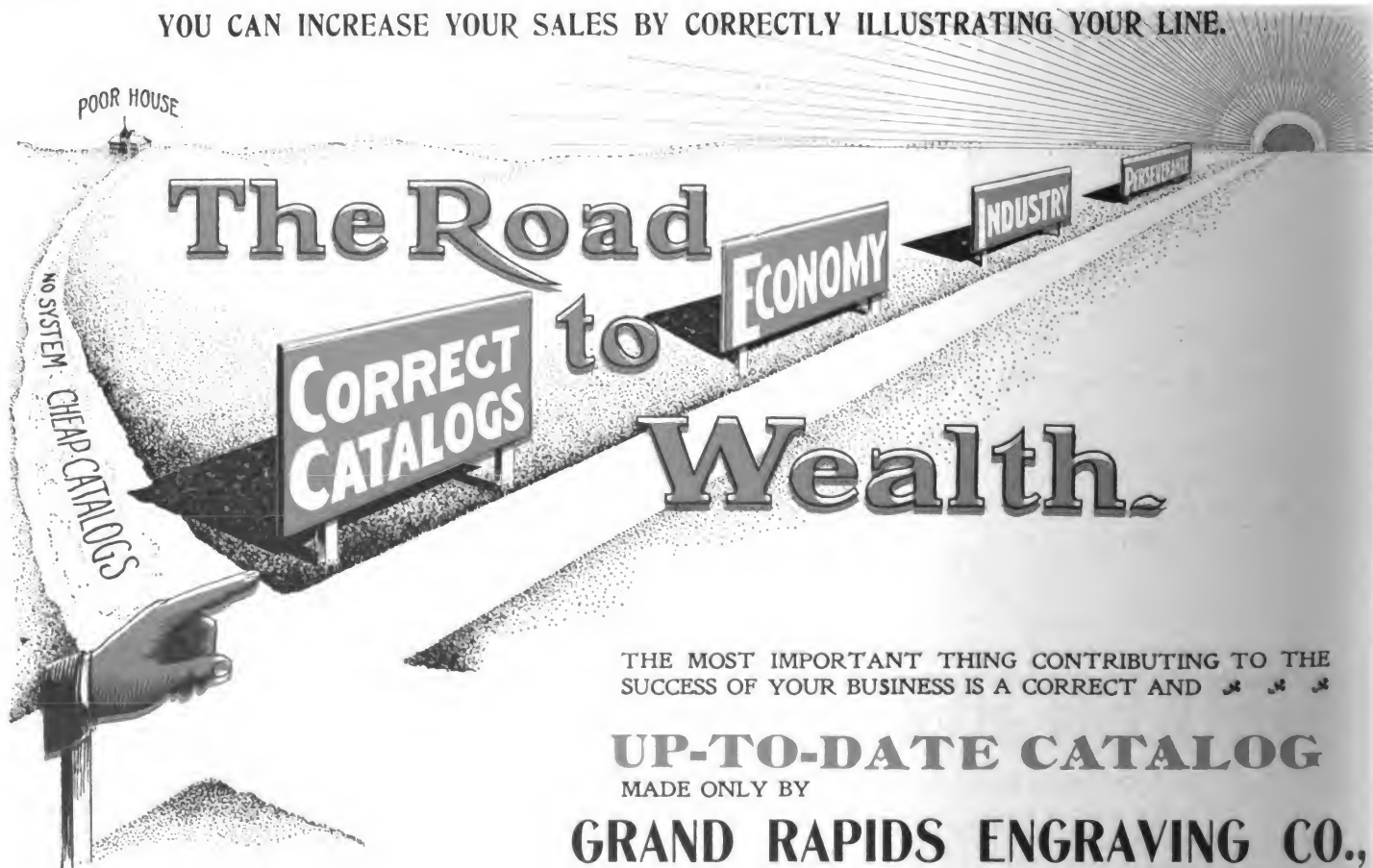
Steel Wool is very light, but exceedingly durable, and in corners or cornices, and on mouldings where sandpaper is used only with the greatest difficulty, labor and expense of time, Steel Wool does the work easily, with little labor, and in just one-half the time. Special Discounts to Consumers for Large Quantities. Write for Quotations.

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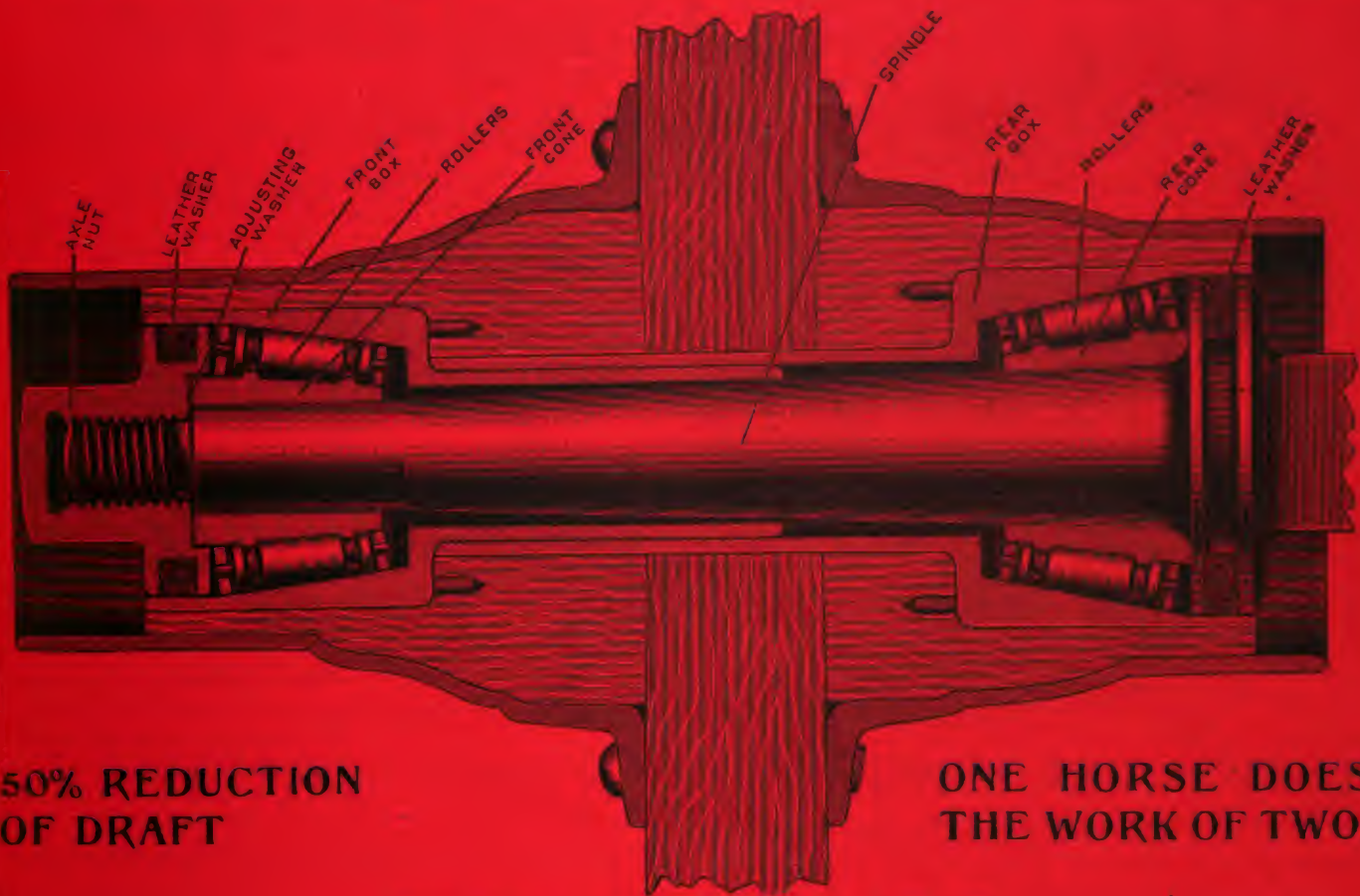
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50% REDUCTION
OF DRAFT

ONE HORSE DOES
THE WORK OF TWO.

Patents, 606,635, June 2th, 1898. No. 606,636, June 28th, 1898.

INSTRUCTIONS FOR PUTTING WHEELS ON:

*Slip rear cone on spindle,
Put wheel on,
Slip front cone on spindle,
Screw up axle nut tight,
Drive off.*



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HENRY TIMKEN, President,

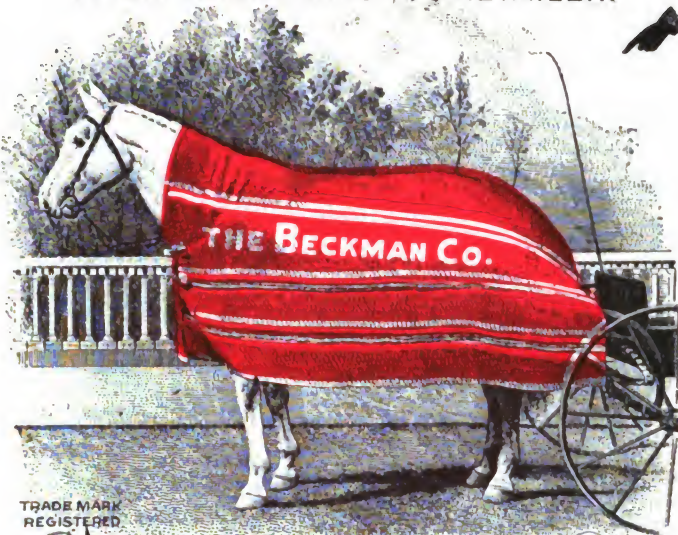
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ST. LOUIS, MO.

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SHORT CUT MILL TO RETAIL.

FROM MILL DIRECT TO RETAILER.



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NORTHERN OHIO BLANKET MILLS,
Largest and Best Equipped in the World.

IF THIS IS MISSING FROM ECLIPSE, J. I. C.,
MONITOR BLANKETS, THEY ARE CHEAP
IMITATIONS.

OURS ARE ALL WOOL—50 PER CENT. BETTER.

WE LEAD THE MARKET WITH

Golden Fleece Fawn, } Beautiful Color, Lofty Nap.
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Greenland, } Fast Dark Green.
Scarlet Borders. } Attractive, Quick Seller.

Guy, } Fast Blue, Best in Class.
Scarlet Borders. } Thoroughly Reliable.

XX. Greenland, } Fast Dark Green.
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Black Diamond, } Fast Black.
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All Wool Fawns—Dark Greens, Blues, Blacks.

Largest Line of All Wool } New, Bright, Stylish.
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Natural Gray Staples—Wool, Wear for Ever.

Full Weight, Sizes and Values, Fast Colors.

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CLEVELAND, OHIO.

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THERE will be 20,000 BIKE WAGONS built and sold in 1900. One-half of these will be high-grade work, equipped with first-class guaranteed tires. The balance will be medium-grade work, equipped with light construction, low-grade tires, unbranded, or branded with a single name backed up by a supposed guarantee, printed on a slip of paper, pasted on seat of wagon, the provisions of which read: Not responsible for punctures, stone bruises, rim cutting, etc. The above clause represents 95 per cent. of all troubles, consequently guarantee is misleading. High-grade heavily constructed tires withstand these troubles, although rim cutting is entirely the fault of the driver. The tire is either not inflated sufficiently, or leaks for one cause or another, and should be attended to immediately. We are making only the Diamond Single Tube Pneumatic Carriage Tires, bearing brand like cut shown. We know this tire is made with a knowledge of the demands, and we are prepared to back it up regardless of expense.



Made in Akron, Ohio, by

THE DIAMOND RUBBER CO.

Please mention "The Hub" when you write.

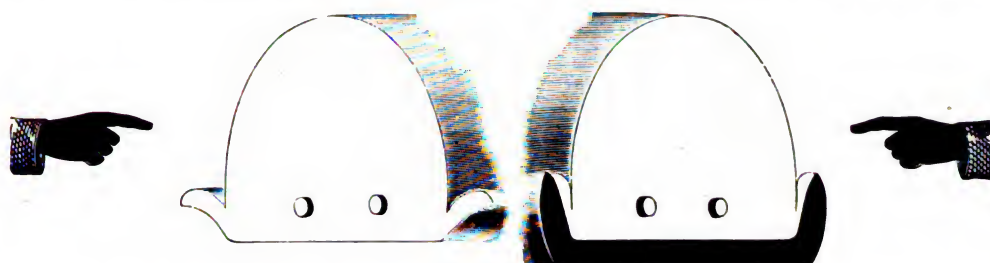
THE GOODYEAR "WING" TIRE

Patented April 25, 1899. No. 623,703.

WARRANTED

Highest in Quality,
Best in Service,
Longest Life,

OF ANY SOLID TIRE ON THE MARKET



SEE THAT WING ?

...IT...

PREVENTS

CUTTING OR CHAFING
ON CHANNEL.
DIRT OR WATER FROM
GETTING UNDER TIRE.
CREEPING.

*We furnish a simple and effective machine
for applying tires to wheels.*



200 MANUFACTURERS & DEALERS

NOW USING OUR TIRES, UNQUALIFIEDLY ENDORSE
ABOVE.



The Goodyear Tire & Rubber Co.,

AKRON, OHIO, U. S. A.

WRITE FOR PARTICULARS

Varnish Troubles and Color Kinks.



May be avoided by
using the best goods
on the market.

WRITE TO

FELTON, SIBLEY & CO.,

Makers of High Grade Varnishes
and Superfine Colors.

136-140 North 4th Street,
PHILADELPHIA.

Painted Surfaces on Vehicles
receive

HARD USAGE.

A smooth, brilliant coating, durable both as
to color and material, can only be obtained with
ZINC WHITE, or combinations based on **ZINC
WHITE**.

THE NEW JERSEY ZINC CO.,

71 Broadway,

FREE: Our Pamphlets:

NEW YORK CITY.

"The Paint Question,"

"Paints in Architecture,"

C. AWILLEY'S CARRIAGE PAINTS.

SEND FOR DESCRIPTIVE LIST

C. AWILLEY, HUNTERS' POINT, NEW YORK, N.Y.

DURABLE.

RELIABLE.

WM. HARLAND & SON,

MERTON, SURREY, ENGLAND

English Varnishes



AND Coach Colors.

—BRANCHES:—

4 GOLD STREET, NEW YORK.

Paris, France, and Milan, Italy.

BRILLIANT.

ECONOMICAL.

EXPORT TRADE!

manufacturer and dealer in 20 Foreign Countries. Give it a trial and be convinced. For rates and further particulars, write
TRADE NEWS PUBLISHING CO., 24-26 Murray St., New York.

Does it interest you? Are you looking for it? If so, we think
you would find it to your advantage if you were represented in
THE HUB, as it reaches almost every responsible carriage

FOR SALE.

50,000 Pounds of Solid Rubber Tires

ALL SIZES, 3/4 INCH TO 2 INCHES.

... Manufactured for the ...

CONSOLIDATED RUBBER TIRE COMPANY, 40 Wall Street, N. Y.

This rubber is made of their latest compound, the "Special," and not the "PP" or
"IJ" heretofore used by them, and is guaranteed EQUAL TO ANY and SUPERIOR
TO MOST of the rubber sold by the Consolidated Rubber Tire Company.

WRITE FOR PRICES, STATING SIZE AND
QUANTITIES. See our ad. on page 7.

THE GOODYEAR TIRE & RUBBER CO., Akron, Ohio.

Please mention "The Hub" when you write.

Carriage Painters

Do You Know Us?

Do You Know Our Product?



*What do You Think of It?
Have You Given It a Trial?*



HAVE you seen our new Catalogue G, and are you familiar with the line of Panel Ornamentation that we are supplying to the trade? Do you know that it is to your interest to keep in touch with us? We are getting up new schemes for Ornamentation constantly, and what we get up are new and not the old, antiquated, out of date, 50 years behind the times, ridiculously mixed up style of colors, formerly furnished by the foreign importers. Our designs are new and up to date, as well as original style of ornamentation. It is foolish for you to spend fifty cents or a dollar for decorating that can be done for 15 per cent. or 20 per cent. of that cost and can be done much better at that.

Do not assume that we are trying to sell you these old styles. Do not take anything for granted. Write us for our catalogues and samples, which are free for the asking. We not only have these panels but other work of that character, as well as delicate scroll ornamentation, such as you see on the highest grade vehicles. Does it not appeal to your reason that when twelve short months ago we were not known in the field, and in that short period we have worked up a business of \$100,000 per year, there must be merit in the product?

Orders for special designs, whether for the vehicle or any other industry, receive prompt attention.



THE MEYERCORD CO., INC.,

American Manufacturers

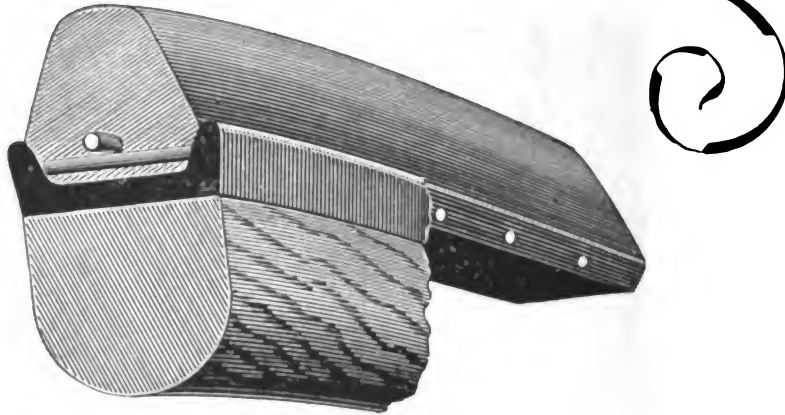
Guaranteed Decalcomania Transfers.

NEW YORK OFFICE,
805 St. James Building.

MAIN OFFICE, Chamber of Commerce,
CHICAGO.

..... A PERFECT TIRE

"Wemaka" Rubber Tire



THE "WEMAKA" TIRE is constructed with cross-stays vulcanized in the Rubber itself, the Tire being held in place by a separate retaining band, being independent of cross-stays, which permits the longitudinal compression of Rubber along the retaining band, and where the Rubber is compressed in the channel the pressure of the retaining band is distributed and equalized by the cross-stays throughout the entire length and width of the Tire. It is absolutely impossible for the Tire to roll out of channel, or the longitudinal wire to cut through the Rubber, a defect so commonly found in other makes of Tires. * * * * *

"WEMAKA" RUBBER TIRE CO., 346 Wabash Ave., Chicago, Ill.

C & B
LINE

**BUFFALO
TO
CLEVELAND**
"While you Sleep"

UNPARALLELED NIGHT SERVICE. NEW STEAMERS

"CITY OF BUFFALO"
AND
"CITY OF ERIE,"

both together being without doubt, in all respects, the finest and fastest that are run in the interest of the traveling public in the United States.

TIME CARD,
DAILY INCLUDING SUNDAY.

Leave Cleveland 9 P.M. Arrive Buffalo 7 A.M.
" Buffalo 9 " " Cleveland 7 "

EASTERN STANDARD TIME.

Connections made at Cleveland with trains for all points West and Southwest. Ask ticket agent for tickets via C. & B. Line. Send four cents for illustrated pamphlet. SPECIAL LOW RATES TO CLEVELAND EVERY SATURDAY NIGHT.

W. F. HERMAN,
GENERAL PASSENGER AGENT,
CLEVELAND, O.

The Picturesque Route



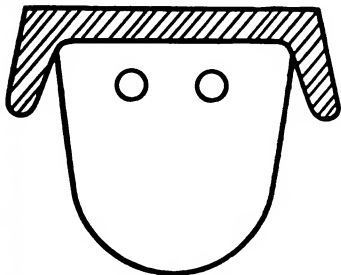
of America

Between East and West.

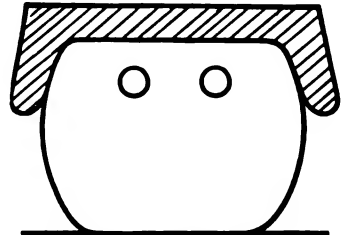
New York, Buffalo, Niagara Falls,
Cleveland, Cincinnati, Chicago.

Langmuir's Patent Improved Solid Rubber

CARRIAGE TIRE



NORMAL



UNDER LOAD

This tire does not open at the joint and consequently it does not require compression; does not creep; does not cut out at the

base; does not split or scalp; all on account of the V-shaped space between the tire and the flanges. We supply the trade with all sizes from ¼ to 2 inches inclusive. We furnish a complete outfit for applying all sizes, ¼ to 2 inches.

PUT THEM ON IN YOUR SHOP IN THE REGULAR CHANNEL IRON IN USE

REVERE RUBBER CO.

Sole Manufacturers, 59 & 61 Reade St., New York

THE CLARK VALVELESS
Pneumatic **TIRE.**

WITHOUT A VALVE

For Carriages and Automobiles.

No Valve Stems to tear away. No Lugs or Bolts to work loose and cause troublesome leaks.

THE CLARK VALVELESS has many other points of superiority over the ordinary pneumatic tire with the valve, that are fully described in our new illustrated catalogue, which we send you free on request.

CLARK CYCLE TIRE CO.,
SOLE MANUFACTURERS OF
THE CLARK VALVELESS,
EQUITABLE BUILDING, BOSTON, MASS.

SPECIALTIES FOR AUTOMOBILES



...ALL KINDS OF...

Lamps, Silver Handles, Door Handles, Sash Fasteners, Concealed Key Holes, Sash Knobs, Front Toe Board Steps, Silver Molding, Rubber Head Tacks, Special Hexagon Nuts and Collars, Etc. (Samples sent on request.)

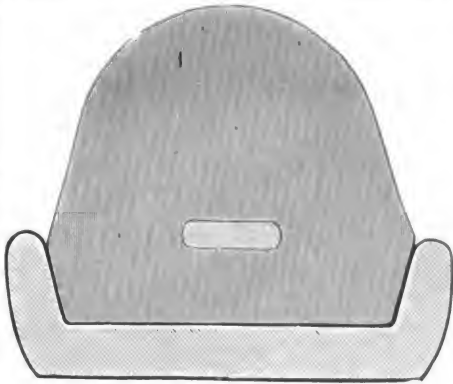
...MANUFACTURERS OF...

CARRIAGE HARDWARE AND SPECIALTIES
FOR ALL VEHICLES.

Corner Irons, Pray's Apron Fasteners, "Excelsior" Curtain Fasteners, Cloth and Japan Buttons and Nails.

SEND FOR No. 11 LAMP CATALOGUE.

G. COWLES & Co.,
NEW HAVEN, CONN.



INTERNATIONAL TIRES.



If a carriage builder desires to put up a high grade and stylish vehicle, he commences by selecting a high grade timber for his woodwork, a high grade iron for his iron work, a high grade of paint stock and trimmings, and employs high grade workmen, but occasionally through unfamiliarity with rubber, he omits to put on a high grade tire.

Why not make your vehicle a greater success by including high grade Solid Rubber or Pneumatic Tires? We make them. Write us for prices. * * * * *



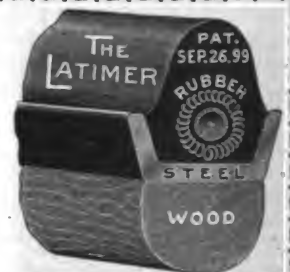
INTERNATIONAL A. & V. TIRE CO.,
346 Broadway, NEW YORK CITY.



RESILIENT

COMPOUND STEEL SPRING

VEHICLE TIRES.



After a test of one year and a half we are pleased to place this Tire before the people. This Tire will take the place of pneumatic tires for vehicles as well as solid rubber tires. It is more resilient than solid rubber, therefore will stand more wear. It will not crack off at the top of the channel like solid rubber tires, as the Compound Steel Springs will keep the rubber from cracking at that point. The two coils of wire are in telescopic (or tubular) engagement with each other and embedded in a body of rubber at a very high pressure, so as to form a solid mass of rubber and springs. We use one wire to fasten the tire to the channel which runs through centre hole. The ends of wire are brazed and the wire drawn tight on bottom of coiled spring gives wide bearing footing and makes it impossible for tire to rock.



WIRE PULLER.

With this Puller, which we furnish, a Blow Torch and Vise, any ordinary mechanic can set our tires.

THE LATIMER RUBBER TIRE CO.



CHICAGO,
 24 South Clinton Street.

NEW YORK,
 15 Platt Street.

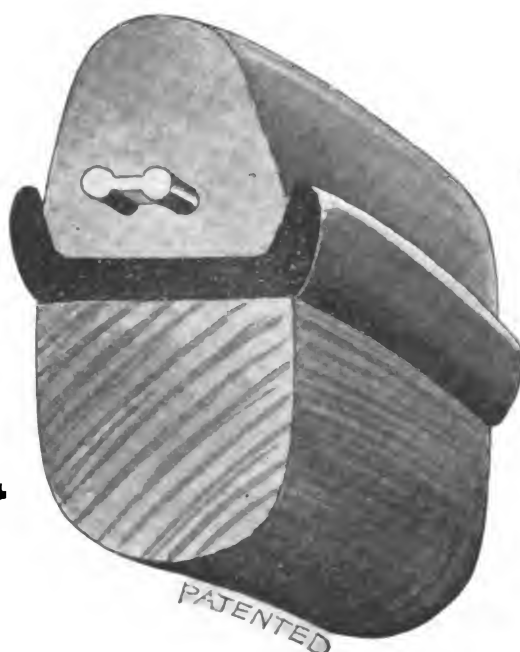
WORKS, HUNTLEY, ILL.



Please mention "The Hub" when you write.

We Make Our Own Rubber

*In Our
Own
Factory.*



*From
Our
Own
Formula*

*This Tire wears out where it should—on
the TREAD—NOT by cutting through
the BASE or SIDE.*

~~~~~  
*OUR MACHINE,  
OUR RETAINING BAND,  
OUR FASTENING DEVICE,  
ARE UNSURPASSED.*

~~~~~  
CALUMET TIRE RUBBER CO.

**116 to 128 North Lincoln Street,
CHICAGO, ILL.**

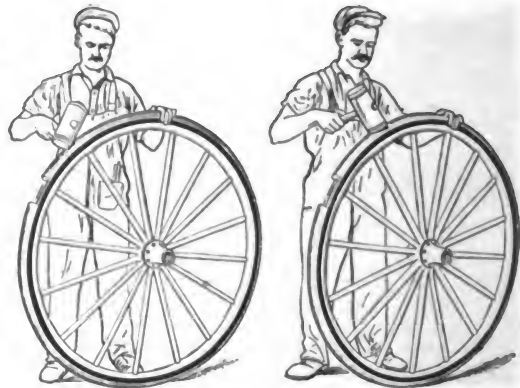
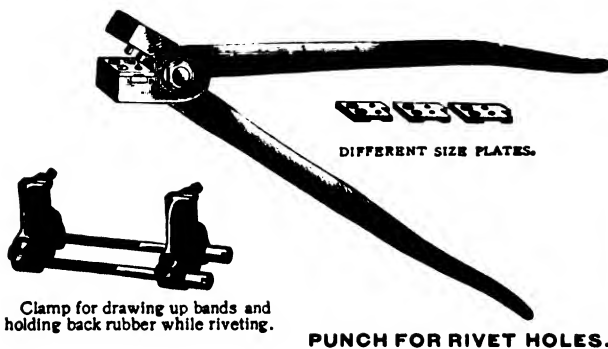
MORGAN & WRIGHT TIRES
ARE GOOD TIRES

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

THE
MORGAN & WRIGHT
SOLID
RUBBER
VEHICLE
TIRES



Are Fastened In the Channel by Means of a Steel Band.



No. 1.

No. 2.

With this set of tools (which we furnish at nominal cost) and an ordinary vise, any mechanic can fasten them on.

We furnish channels, tires and tools complete.

Cut No. 1 shows the RIGHT way to pound a solid Rubber Vehicle Tire to bring the two ends together after it has been fastened in the rim. Cut No. 2 shows the WRONG way. ALWAYS strike a GLANCING blow, as shown in Cut 1, and NEVER strike a STRAIGHT blow, as shown in Cut 2.



We also make the Cactus Carriage and Pneumatic Carriage Tires in all sizes and diameters. Full information regarding our tires sent on request.



NEW YORK BRANCH:
214-216 W. 47th Street.

MORGAN & WRIGHT
331 WEST LAKE STREET
CHICAGO.

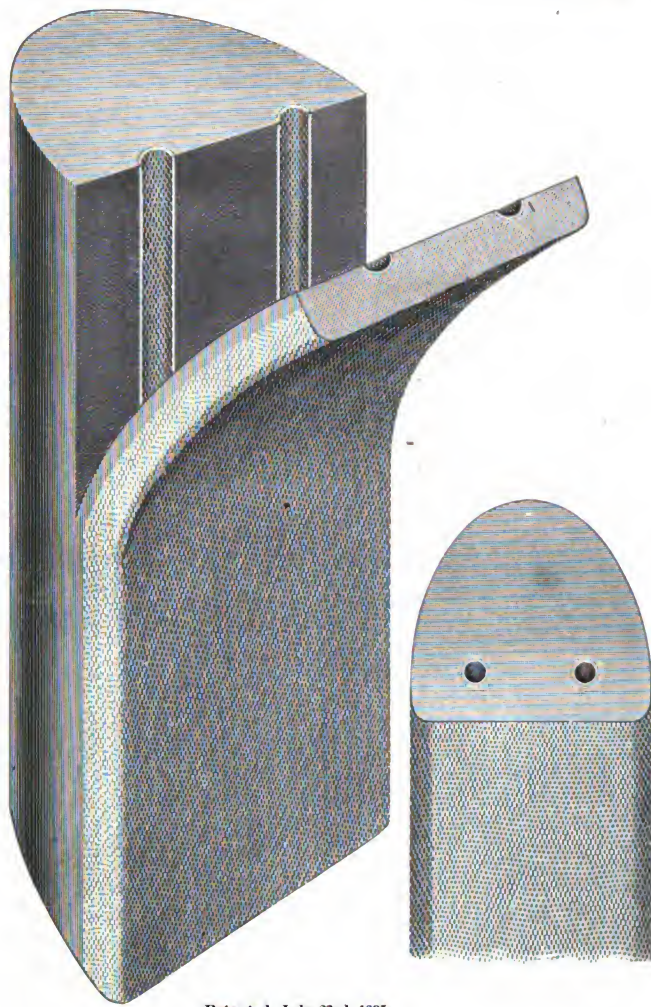
BOSTON BRANCH:
80 Battery March Street.
Near Fort Hill Square.

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

The Reason Why THE **VICTOR** TIRE

*Wears
longer
than
any*



*Other
is
because
of its*

Patented, July 23rd, 1895.

Insulated Wire Cavities

.....
THE VICTOR RUBBER TIRE CO.,
SPRINGFIELD, OHIO, U. S. A.

New York, - Boston, - London, - and Branches.

Please mention "The Hub" when you write.

Don't Forget

that we make Piano-Box Buggies, Cornings and Concords, as well as Bike Wagons.

All our work is sold in the white—we do no painting whatever.

By thus concentrating our energies and building in large quantities we secure the greatest economy in production.

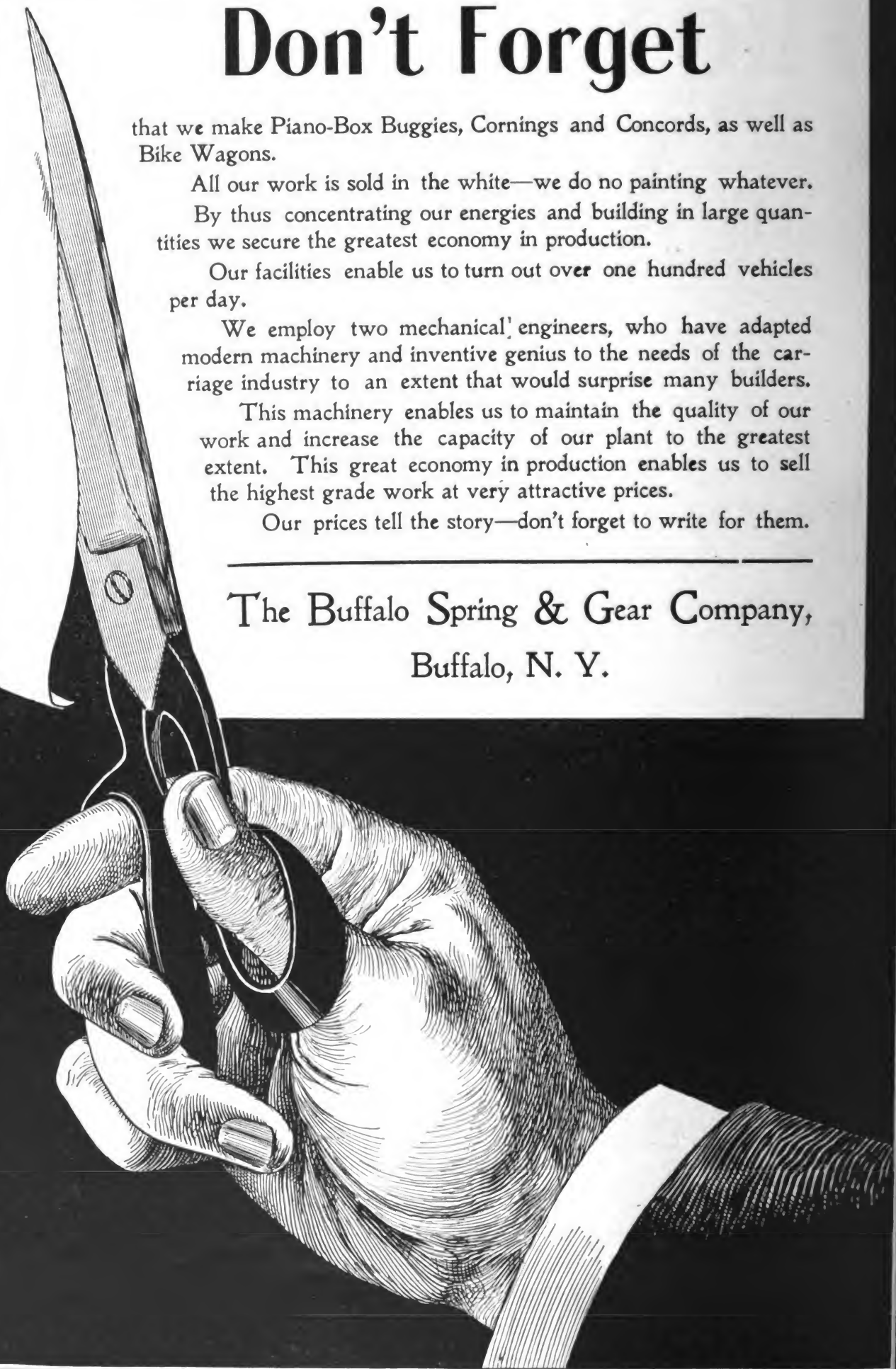
Our facilities enable us to turn out over one hundred vehicles per day.

We employ two mechanical engineers, who have adapted modern machinery and inventive genius to the needs of the carriage industry to an extent that would surprise many builders.

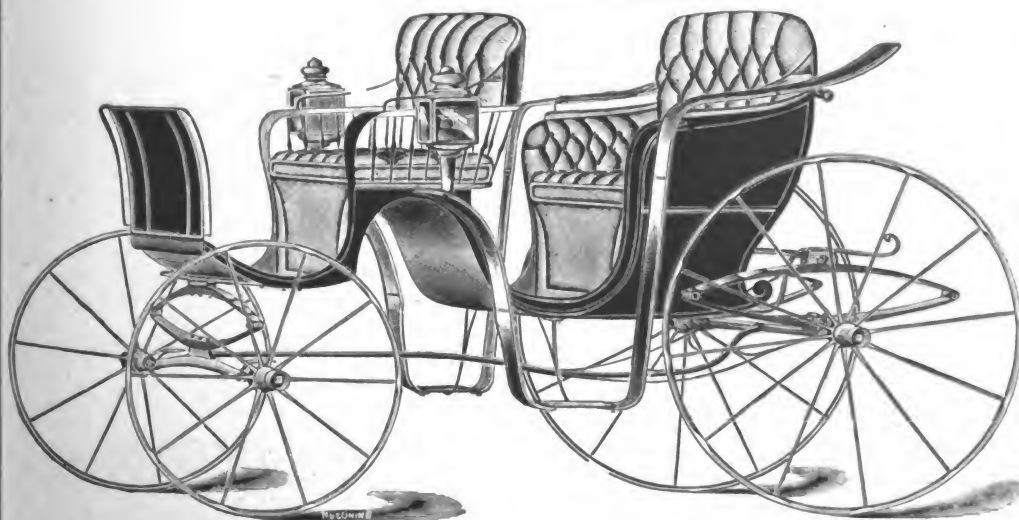
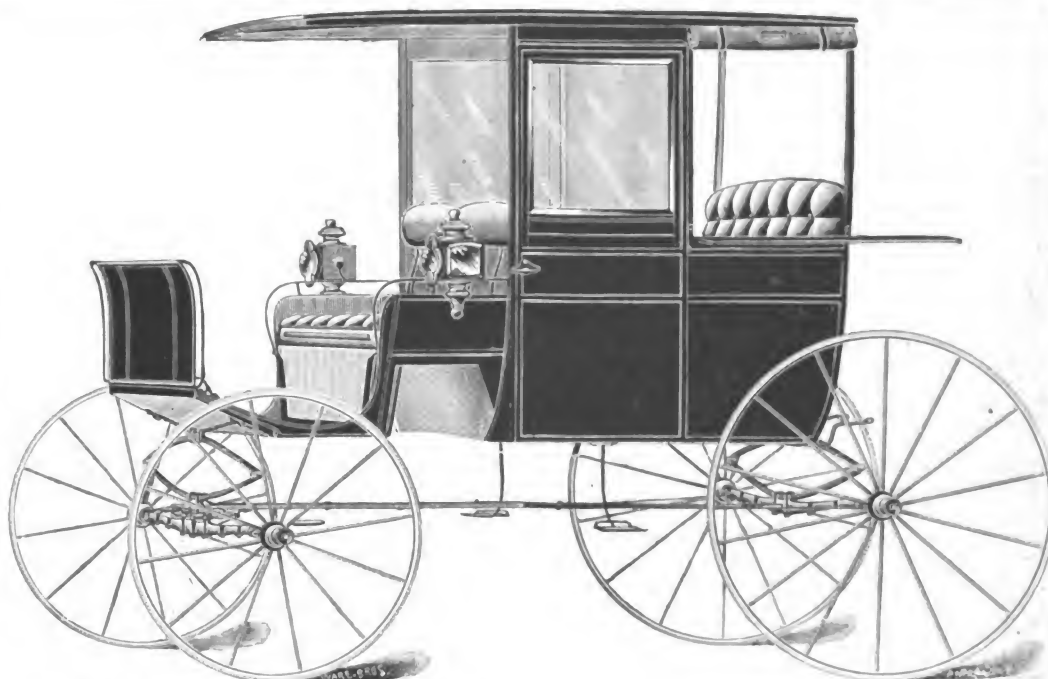
This machinery enables us to maintain the quality of our work and increase the capacity of our plant to the greatest extent. This great economy in production enables us to sell the highest grade work at very attractive prices.

Our prices tell the story—don't forget to write for them.

The Buffalo Spring & Gear Company,
Buffalo, N. Y.

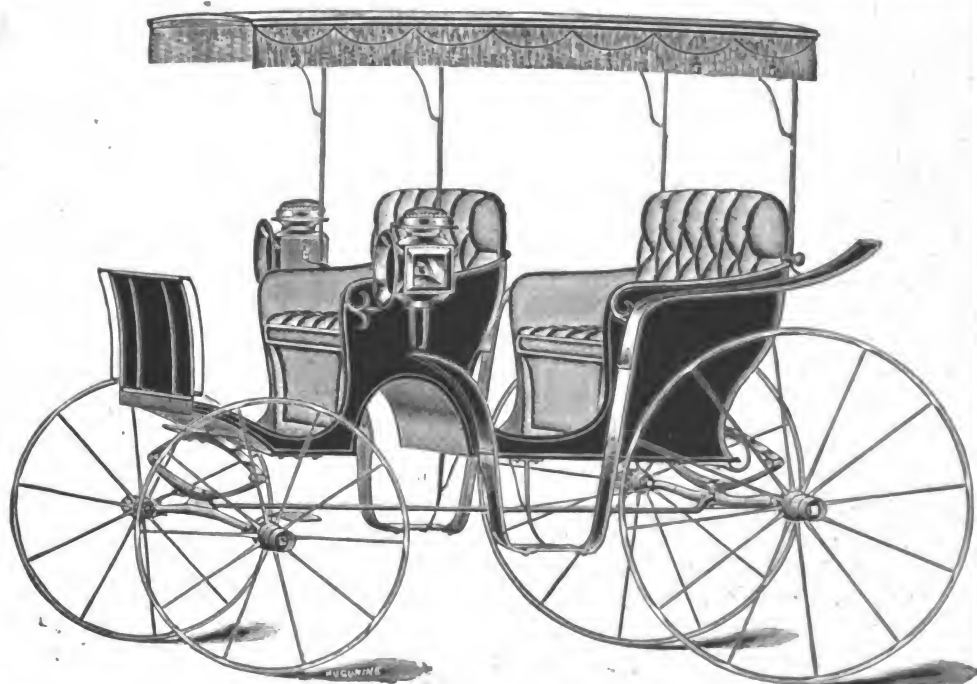


H. H. 
BABCOCK
COMPANY.



WOULD LIKE TO
SEND THEIR NEW
CATALOGUE TO
ALL DEALERS
WHO HAVE NOT
RECEIVED ONE.

WHEN YOU SELL
A BABCOCK VE-
HICLE YOU ARE
ALWAYS SURE
OF PLEASING
YOUR CUSTOM-
ER. ❧ ❧ ❧ ❧



H. H. BABCOCK COMPANY, Fine Carriage Builders,
WATERTOWN, N. Y.

Please mention "The Hub" when you write.

Waterloo Pneumatics.

To The Trade;—

The subject of "Pneumatics" has commanded the earnest attention of progressive carriage builders and dealers during the past season to a remarkable degree.

The conclusion reached by both is that, to be a permanent success, Pneumatic Vehicles must be constructed of the best material, honestly put together.

It is just this combination that we are offering to the dealer who appreciates a good looker, a good seller and a good laster in a Pneumatic.

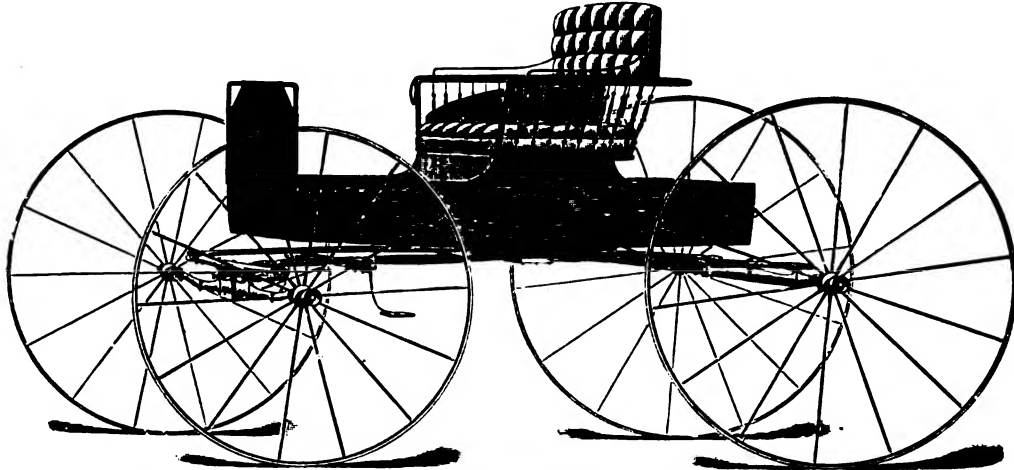
In The Rex Pneumatic Road Wagon, shown herewith full appreciation of first impressions its unusually pleasing proportion this is the recognition lying principle that lasting friendship is, above all, due to good wearing qualities — nothing but the very best of material is used in any part of this vehicle and it is sold on this guarantee.



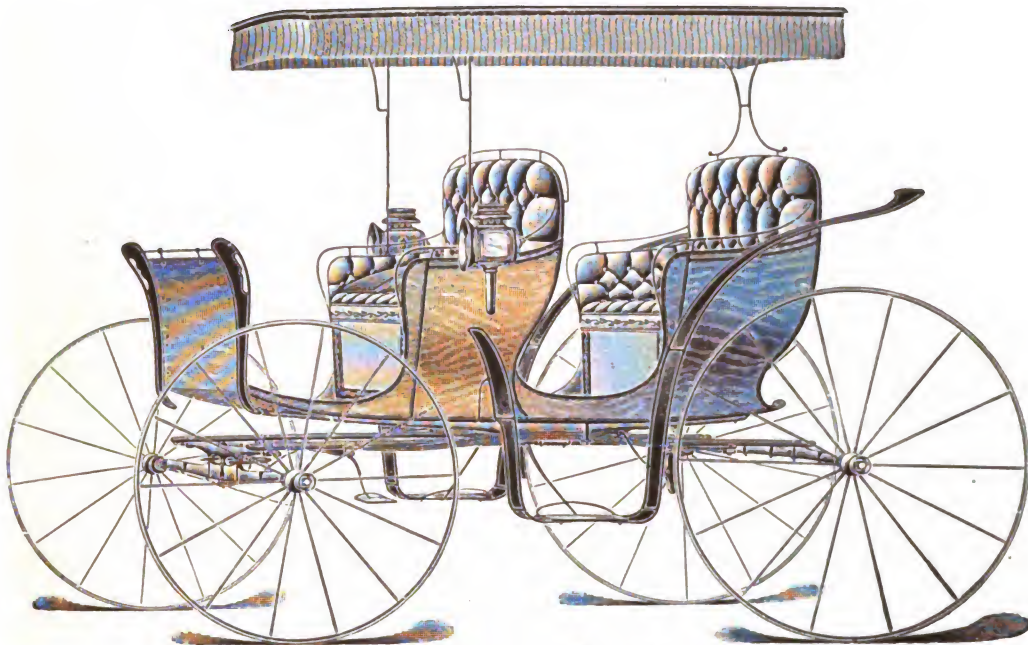
Its price, quality considered, is also very attractive, and we solicit correspondence from prospective buyers believing that the intrinsic merit in the "Rex" will win.

Waterloo Wagon Company Ltd.
Waterloo, N.Y.

In the Construction of Our **GLENS FALLS BUCKBOARD VEHICLES**



No. 430. NEWPORT ROAD WAGON BUCKBOARD.—Glens Falls Gear.



No. 445. CARLSBAD CARRIAGE BUCKBOARD.—Glens Falls Gear.

WE AIM:

First - - AT DESIGN. Our designs are prepared with an eye to artistic proportion, combined with comfort.

Second - - AT QUALITY OF MATERIAL. We use nothing therein that is not of the Very Highest Grade.

Third - - AT WORKMANSHIP. We employ in their construction none but the highest class of workmen, experienced in Buckboard building.

Fourth - - AT FINISH. We finish these Vehicles in such a manner that they are not only beautiful when new, but they will grow old gracefully, taking on with age those rich tones and colorings so pleasing to the artistic eye.

Fifth - - AT EQUIPMENT. Judged by the most critical and exacting standards, our equipment for comfort and convenience is complete in every detail.

Sixth - - AT PRICE. Our price is as low as it is possible to offer an absolutely high grade Buckboard.

Correspondence Solicited.

WATERLOO WAGON CO., Limited, **WATERLOO, SENECA COUNTY, N. Y., U. S. A.**

Please mention "The Hub" when you write.

YOUR POLE

NEED
NOT
BE
VERY
LONG
TO
KNOCK
THE

REX Persimmon



Our Prices Are Low
Our Quality High

Are
You
With
Us?

Rex Buggy Co.

Connersville, Ind.

Write for Catalogue and Prices.

Please mention "The Hub" when you write.

Hoover Wagons

ONLY FIRST-CLASS MATERIAL USED IN THEIR CONSTRUCTION.



No. 29. "HOOVER" BOTTLERS' DELIVERY WAGON.

Body, plain panel, 7 ft. 6 in. long, 3 ft. 10 in. wide, outside measure. Swinging gate at rear; wire screens at sides. Gear, axle and tire, $1\frac{1}{4}$ in. Springs, front $1\frac{1}{4}$ in. by 5 plate; back $1\frac{1}{2}$ in. by 4 plate. Painting, top panel, dark; belt, red; body green; mouldings, etc., black; gear, vermillion; nicely striped and ornamented. Weight, 800 pounds. Capacity, 1,000 pounds. Made with frame top at slight advance in price.

EXPRESS AND DELIVERY
WAGONS OF ALL KINDS.



EXPORT TRADE
SOLICITED

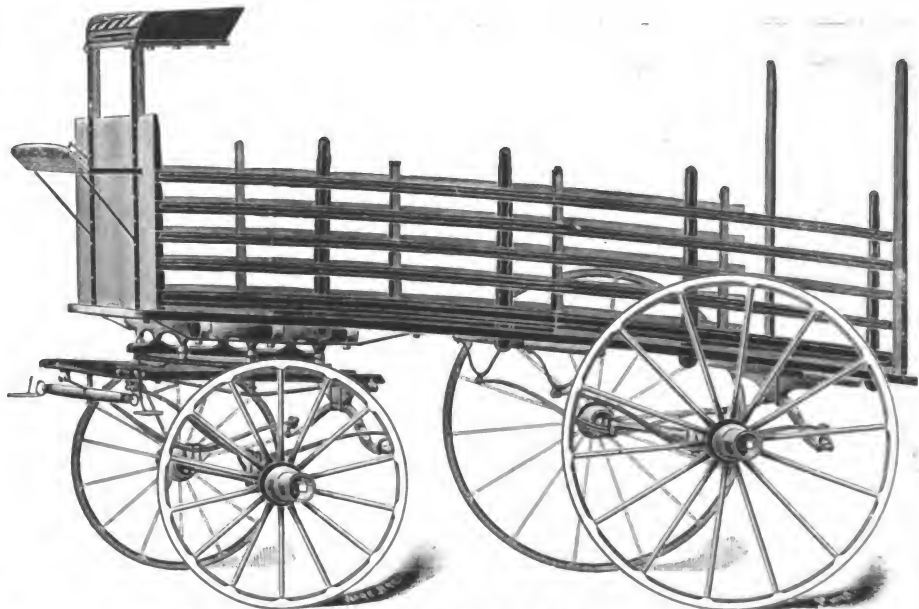


THIS COMPANY HAS BEEN
INCORPORATED SINCE
JANUARY 1, 1900, AND IN
THAT TIME HAS FORTUN-
ATELY BEEN ABLE TO
SECURE THE SERVICE OF
THE BEST SKILLED EM-
PLOYEES IN THE VARIOUS
DEPARTMENTS. ❖ ❖ ❖

HONEST MADE
BUGGIES AND
OTHER PLEAS-
URE VEHICLES.



SPECIAL WAGONS
BUILT TO ORDER.



No. 26. "HOOVER" LIGHT ONE-HORSE TRUCK.

Length, 9 ft. 6 in.; width, 4 ft., outside measurement. Sides removable. Axles $1\frac{1}{2}$ in. Springs, side 2 in. by 7 plate; cross, 9 plate. Wheels, $1\frac{1}{4}$ in. spokes; tire $1\frac{1}{2}$ in. by $\frac{1}{2}$ in. R. E. Steel. Painting, body and gear, vermillion; nicely striped and ornamented. Capacity, 2,500 pounds. Made with shafts only. Pole and brake extra.

HOOVER MOTTO:—"A DOLLAR'S WORTH FOR A DOLLAR,
SERVED AS YOU WANT IT."

These Wagons are manufactured for the trade only, by the

HOOVER WAGON CO.

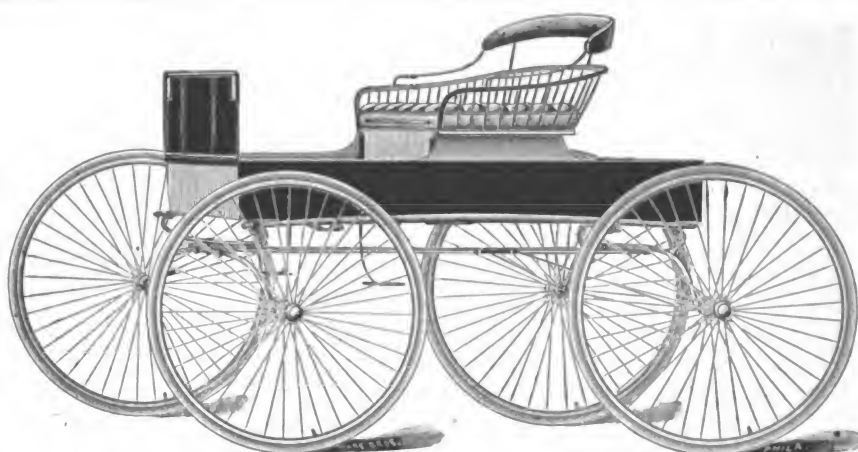
Successor to G. W. HOOVER & SONS,

YORK, PA., U. S. A.

WANTED

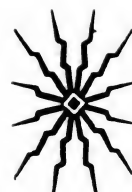
Live, Up-to-Date Dealers to Handle

THE BEST LINE OF **WAGONS** MANUFACTURED.

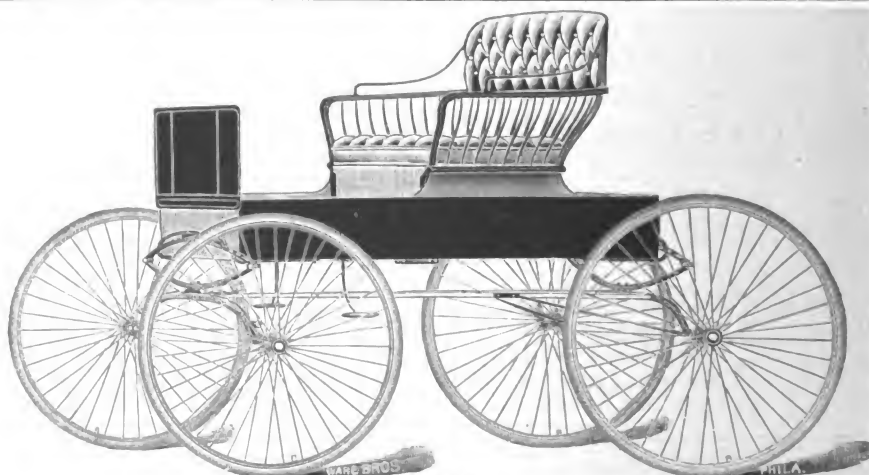


No. 50.

Gentlemen's Light Road Wagon or Speeder.



➡ **THE STIVERS GEAR A SPECIALTY.** ➡



No. 80.

End Spring Pneumatic Runabout.

WRITE FOR CATALOGUE, TERMS, ETC.

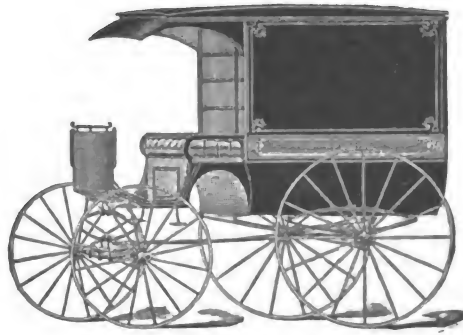
G. W. & H. D. CRAWFORD CO.

DELHI, N. Y.

Please mention "The Hub" when you write.

Best in the Market

We build
Honest Wagons
at
Honest Prices.



No. 35

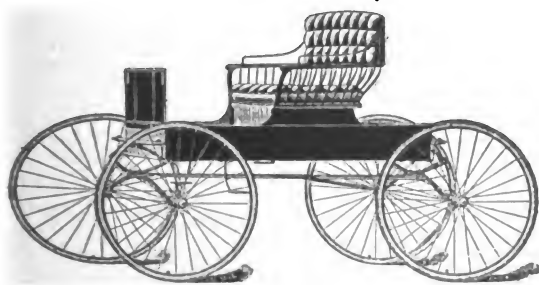
The
Quality
of our work is
Guaranteed.

.....WRITE FOR OUR ILLUSTRATED CATALOGUE AND PRICE LIST.....

THE O. ARMLEDER CO.,

Cincinnati, Ohio.

THE FAMOUS RUBINSTEINS.

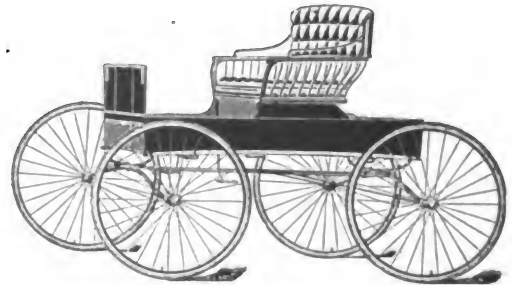


STRICTLY HIGH GRADE.

SURE SELLERS.

TRADE WINNERS.

1900 Catalogue Illustrates Our
Full Line.



RICHLAND VEHICLE CO.,

(Successors to RICHLAND BUGGY CO.)

MANSFIELD, OHIO.

COLUMBUS BUGGY CO.

COLUMBUS, OHIO,
MANUFACTURERS OF

HIGH GRADE VEHICLES ONLY.

DEALERS WHO ARE WIDE AWAKE TO THEIR OWN INTEREST SHOULD NOT BE WITHOUT COLUMBUS BUGGY CO.'S VEHICLES. NO REPOSITORY IS COMPLETE WITHOUT THEM. THEY ARE STANDARD THE WORLD OVER. THE NAME GUARANTEES THE QUALITY. WE HAVE MANY NEW AND ELEGANT DESIGNS FOR 1900. GOOD SELLERS.

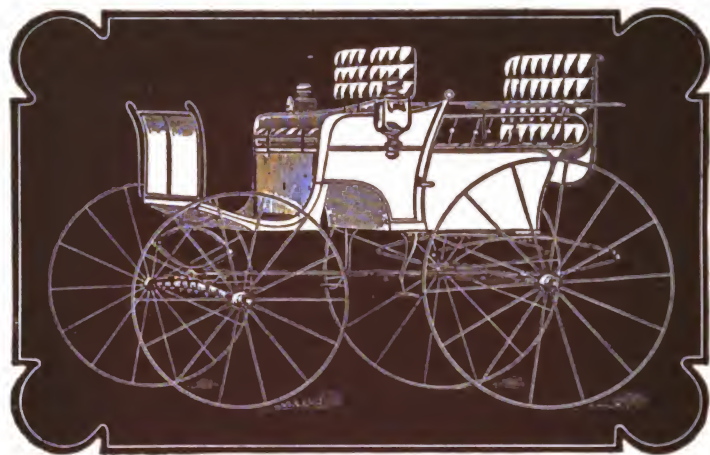
WRITE FOR OUR NEW CATALOGUE.

DON'T FORGET

To tell advertisers that you
saw their advertisements in
THE HUB, when writing
to them.

Please mention "The Hub" when you write.

**We Build the Finest Line of
Traps, Cut-unders and
Straight Sills on the Market.**



No. 27 PARK VIEW TRAP (Patented.)
Showing same as two seated.

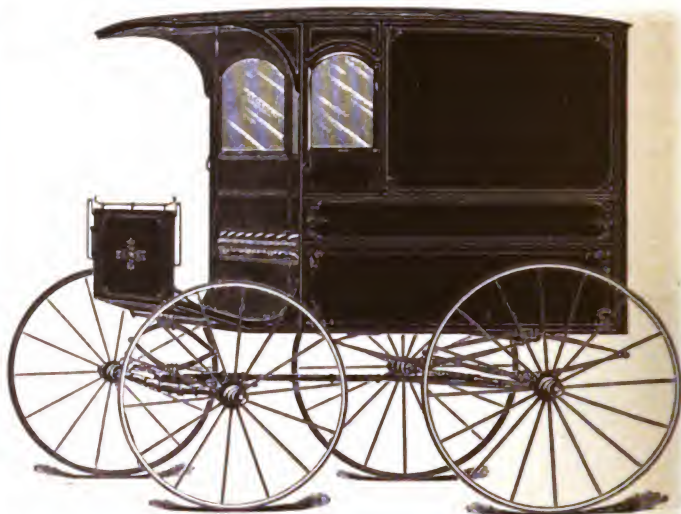
**Our side opening Traps are the
best. Easy to open, and the Lamps
are always in upright position.**

Runabouts with Pneumatic and Common
Wheels. Carts for Domestic Use and
Export a specialty.

J. T. CLARKSON & CO.
AMESBURY, MASS.

Want Something Good?

*Good things usually come high, but then some articles
are sold at fancy prices. We are satisfied with a
reasonable profit and put honest value in all our wagons.*



*Our wagons are good wagons to handle because of their
catchy design, attractive finish and price.*

MR. DEALER: We are after you and that
for your good. Write and see if you don't
agree with us.

ANCHOR SPRING WAGON WORKS,
ELIZABETHTOWN, PA.

Blees-McVicker Carriage Co.

MACON, MISSOURI.

*Nothing but the Best, Most Stylish and
Comfortable*

SEND FOR OUR
HANDSOME
NEW
CATALOGUE.

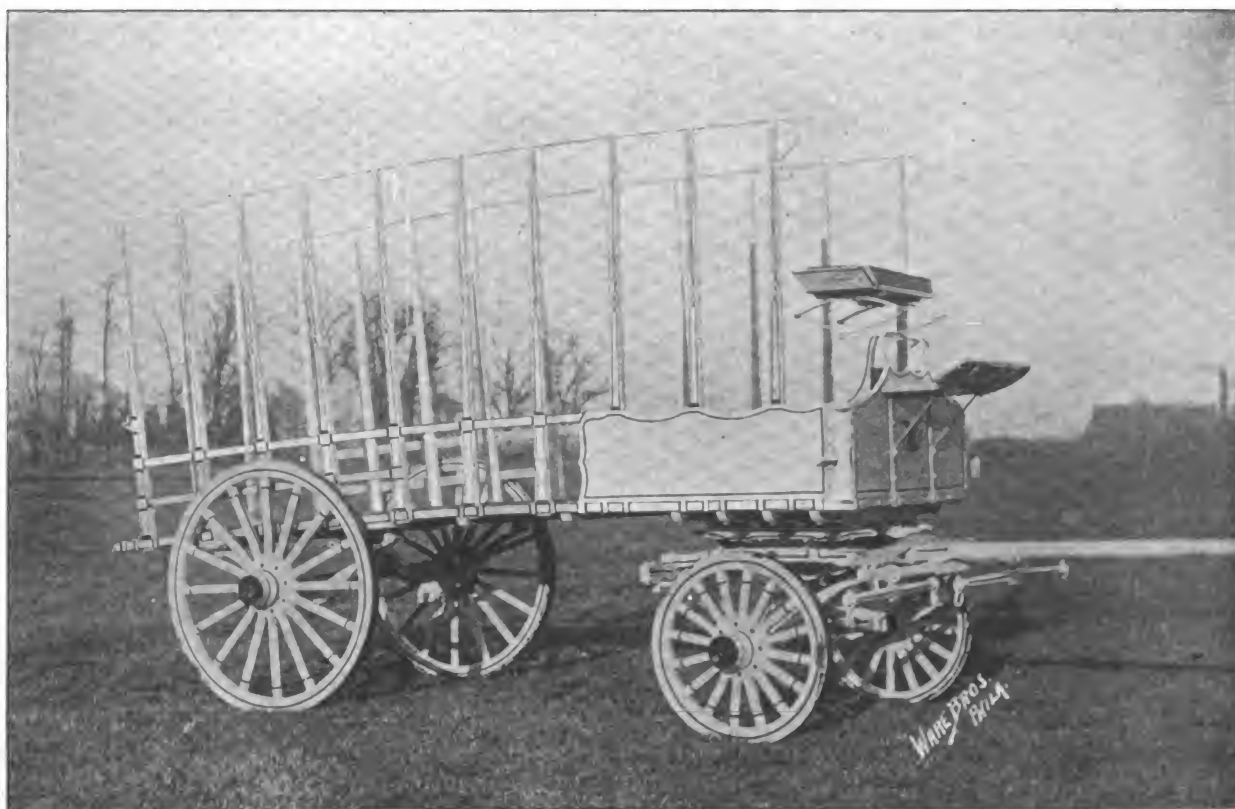
Cabriolets, Carriages, Surreys,

Phaetons, Storm Wagons, Runabouts,

Stanhopes, Buggies and Road Wagons.

TERRE HAUTE

is surrounded with Ash, Hickory, Iron,
Steel and Coal



TERRE HAUTE CARRIAGE AND DUGGY CO.

Builds United States Screen Mail Wagons,
the New Rural Mail Vans, the New Phila-
delphia Postal Carts, and all Brewers' and
Wholesalers' High-Grade Spring Trucks. . . .

TERRE HAUTE, - - INDIANA, U. S. A.

NEW YORK,
302-308 West 53d Street.

PHILADELPHIA,
12th and Locust Streets.

Another of our Specialties—

No. 90**DOCTORS'****PHAETON****"STANHOPE."**

It is impossible to do this vehicle justice with an illustration, it being complete to the minutest detail, and is constructed with an eye single to the wants of the physician. We have equipped it with every convenience for his comfort and it is easy of ingress and exit. In all a very attractive and up-to-date carriage, and like all our specialties sells almost on sight.



No. 90.—Doctors' Phaeton "Stanhope."

Dealers!

We would like to interest you in some of our specialties. Let us send you our catalogue and prices. Dealers handling our Carriage not only make quick sale but also make money.

THE YOUNGSTOWN CARRIAGE & WAGON CO.,

YOUNGSTOWN, OHIO.

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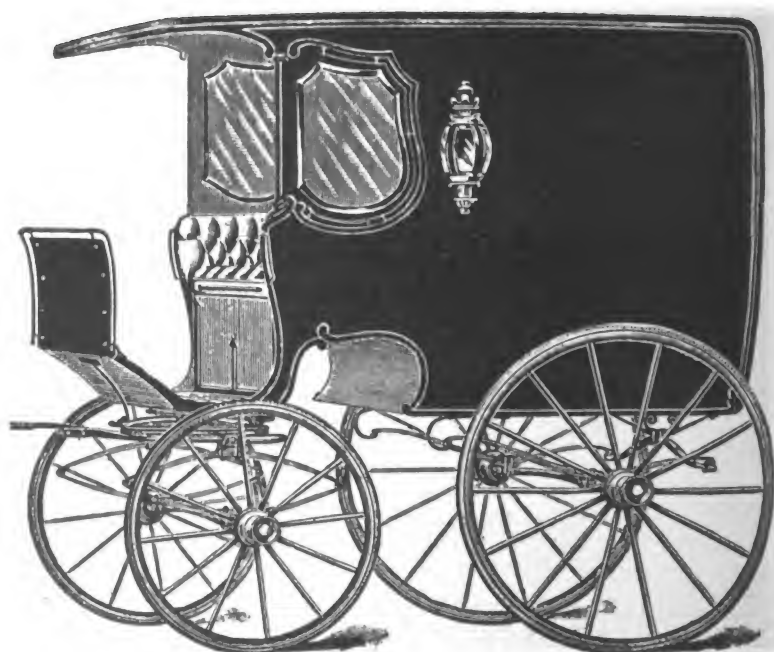
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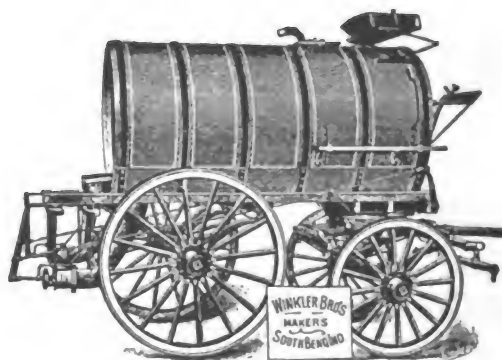
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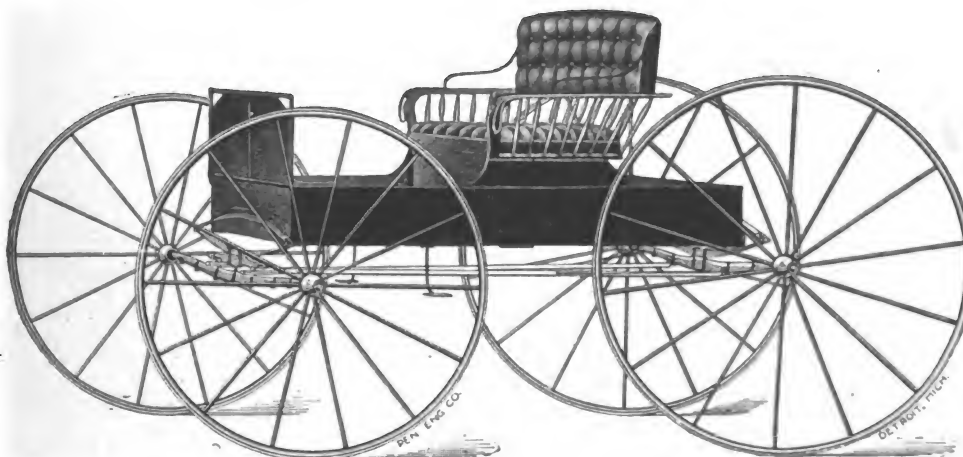
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BODY . . . 23x58 inches, with convex panels. Fancy spindle seat, with solid back. Bailey hangers. Rubber pad steps and seat fenders.
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WHEELS . . Strictly A grade, with screwed rims, either Sarven patent or compressed band, $\frac{3}{4}$ inch tread, 40 and 44 inches high; fitted with the celebrated Springfield rubber tires.
PAINTING . Body and seat, black; gear and wheels, carmine or Newport green, neatly striped.
TRIMMINGS Whipcord, broadcloth or fancy leather. Extra quality velvet carpet, full length.

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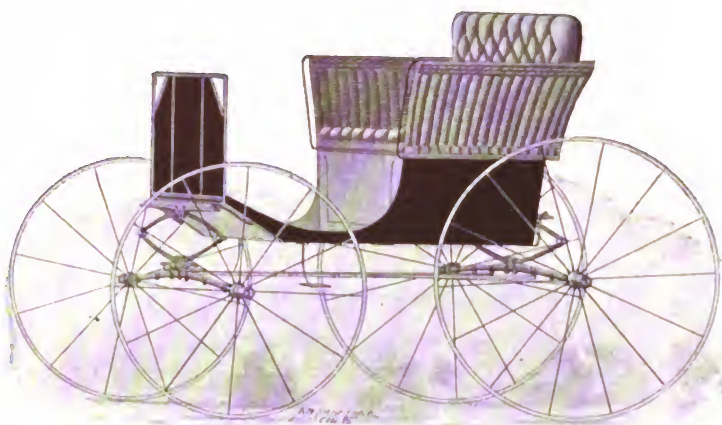


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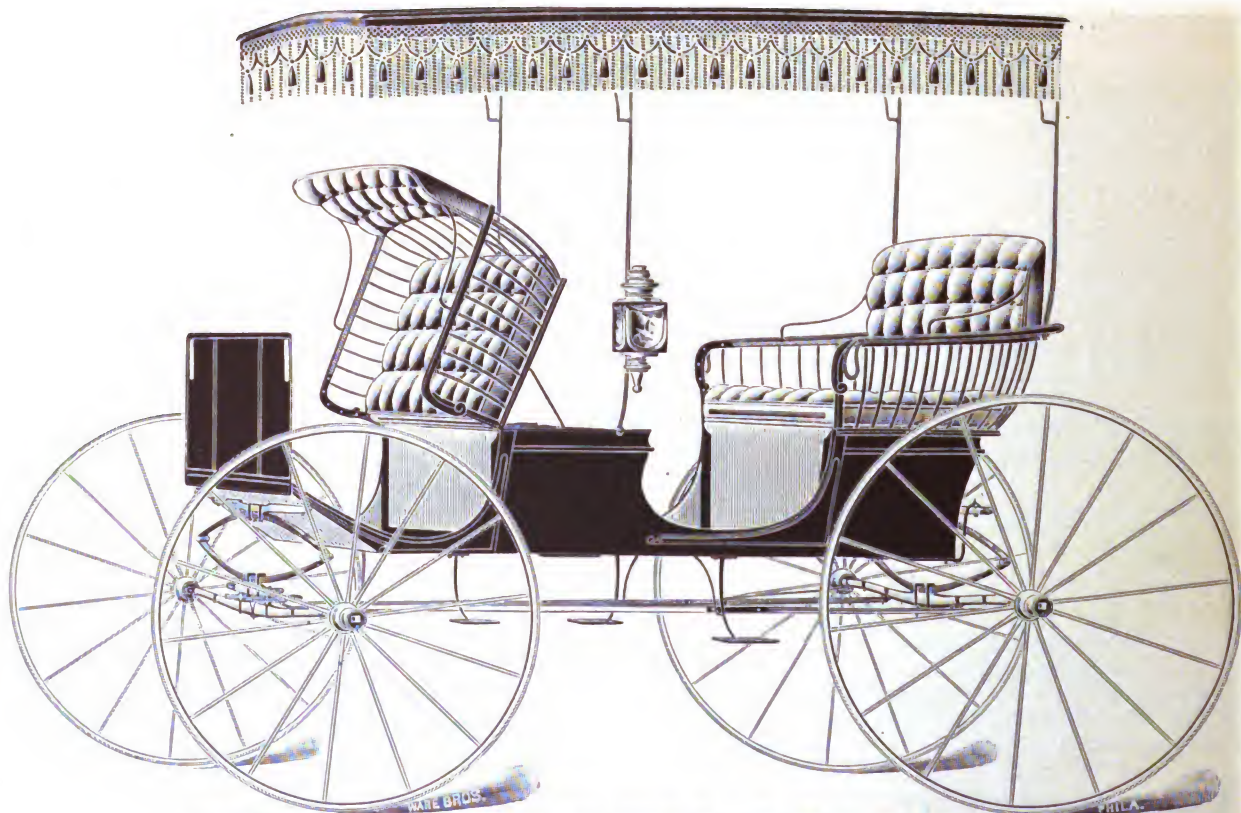
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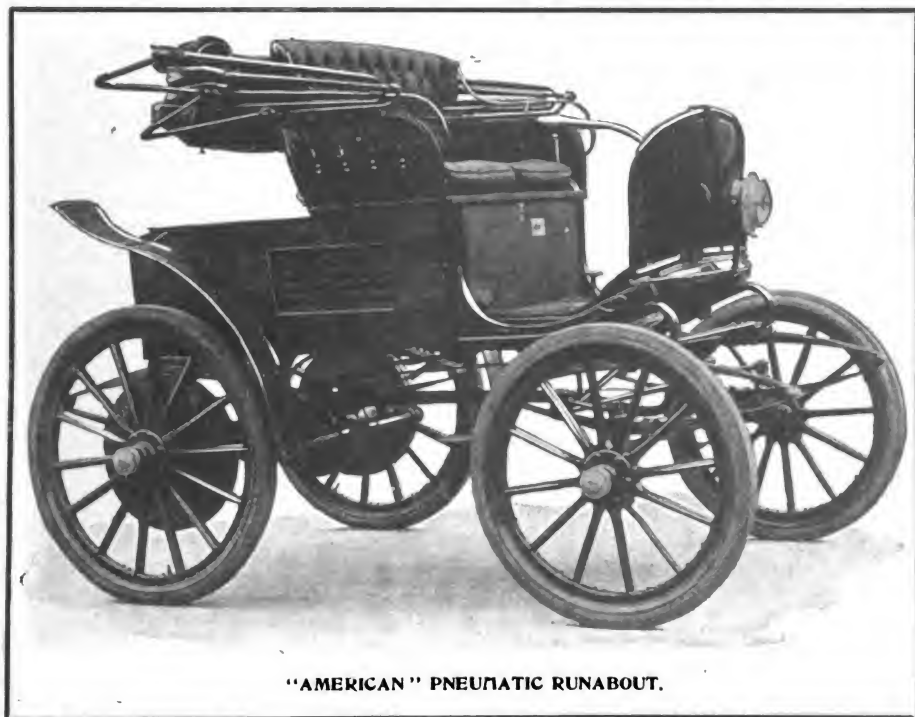
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Our Single Motor Equipment

with hollow armature shaft and solid rear axles, is *OUR OWN SPECIAL AND PATENTED DEVICE*. It secures us the most simple and durable form of motor construction and the most economical and efficient method of delivering power to the wheels. * * * * *

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is suggestive, and we shall be glad to send you one. * * * *



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Hydro-Carbon Motor.
Electric Current required for Ignition provided
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Ignition Regular and reliable.

Speed at Will of Operator and
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Motor Started from Seat by
Simple Device.

One Lever Controls every
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Cost of Operating
Less than One-
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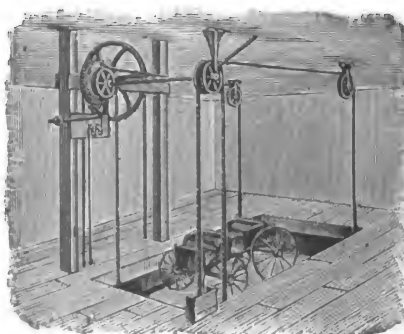
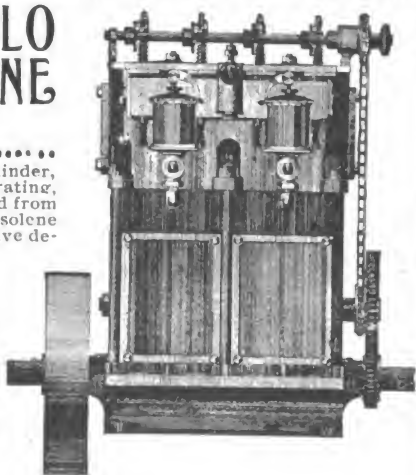
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THE BUFFALO GASOLINE MOTOR

This cut shows our four cylinder,
1½ horse power, non-vibrating,
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Vehicle Motor, which we have de-
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Elevators,

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GLINES' LIQUID RUBBER**
For Automobile, Bicycle, Carriage
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It was the most popular Sundry on the market last season. Look for big sales in 1900.

It is not a Cement, but a Liquid Rubber. It mends punctures and thread leaks instantly. Easy to inject into the tire. Clean to handle, preserves the rubber; once tried, always used. Hundreds of testimonials from repairmen to its superiority over all other compounds.

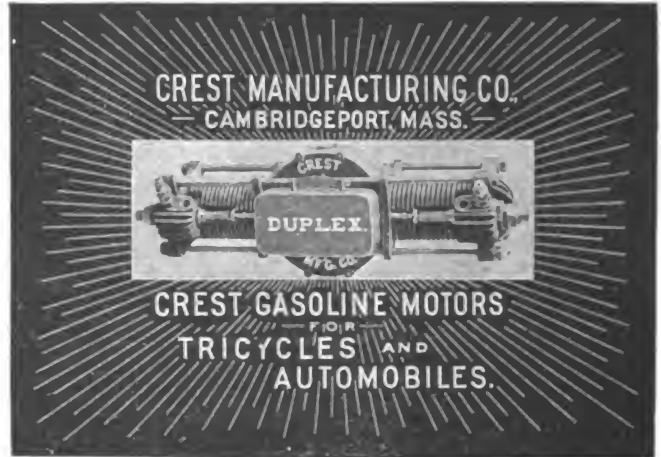
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Why not? It's a good article, popular with riders, gives satisfaction and affords a GOOD PROFIT. Let us quote prices. Get it from your jobber, if you can. If he does not have it in stock, send your order to us. Don't take any stock in that old story, HERE IS SOMETHING JUST AS GOOD.

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RETAILS FOR 50 CENTS.



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ENERGY AXLE OILER.

Saves Oil,
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Absolute
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Always Clean.



Will run all
kinds of Oil,
not only in
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also in winter.
It is the only
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kind which
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Electrical and Mechanical Motor Vehicle Construction.

I am prepared to furnish detail designs of electric and hydrocarbon motors of minimum weight and maximum efficiency.

Designs of controllers, of few parts and extensive performance.

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Complete working drawings of all electrical and mechanical details necessary for constructing motor vehicles.

Expert opinions and consultation.

I can also supply actual construction from the drawings, making the patterns, parts, or completed machines.

If you are entering or contemplating to enter the motor vehicle field send me your address.

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FACTORY OF THE MOBILE COMPANY OF AMERICA VIEW LOOKING SOUTH.

perfecting methods and special tools for the manufacture of the automobile carriage invented by the Messrs. Stanley. The carriage thus perfected is to be known as the "WESTCHESTER COUNTY MODEL," to distinguish it from the carriages of the Stanley type turned out at the works in Massachusetts. It carries the very latest improvements and the orders for its construction have been to use only the finest material, and to spare no pains to turn out the best of which the most skillful workmanship is capable. It is believed that the "WESTCHESTER COUNTY MODEL," built at the factory of THE MOBILE COMPANY OF AMERICA, is not excelled in strength, durability and excellence of design.

WHAT THE MOBILE IS.

The "WESTCHESTER COUNTY MODEL," built by THE MOBILE COMPANY OF AMERICA, is a horseless carriage weighing less than five hundred pounds, and costing but six hundred and fifty dollars. Compactly built, with workmanship of the finest quality, capable of traveling twenty miles or more an hour, or reducing its speed so that it can take its place in the slowly moving and stopping line of travel in the great cities, it is operated by steam under circumstances which render it absolutely safe. More than a thousand Stanley carriages of the Massachusetts model are now in public use, and there has never been a single boiler accident. The fuel shuts off automatically when the steam reaches one hundred and sixty pounds. There is a safety-valve which opens at one hundred and seventy pounds. Each boiler is wound with piano-wire and tested up to six hundred pounds pressure, and is calculated to withstand a strain up to thirty-five hundred pounds pressure to the square inch. Recently, as an experiment, a boiler was placed in an excavation, all valves closed, and the fire turned on full head. A gauge carried off to a distance showed a steam pressure of twelve hundred pounds. Then the steam began to drop, owing to a slight escape around the head of each of the copper tubes which compose the boiler flues, and the pressure did not rise above the twelve hundred pounds indicated, until all the water was exhausted. If the water supply should be exhausted in the boiler through oversight, the pressure drops and the boiler ceases to produce steam, and with the decreased pressure of the steam the carriage comes to a stop and the pump which supplies water ceases to work.

REGARDING THE PRICE OF \$650.

The factory of the company has been fitted up with the most perfect machinery and special tools, all new and of the latest design, for manufacturing on the most extensive scale. In this way the company proposes to bring the price within the reach of every class. The charge made is SIX HUNDRED AND FIFTY DOLLARS, payable upon delivery at the Kingsland Point station of the New York Central Railway. The claim made for THE MOBILE COMPANY'S "WESTCHESTER COUNTY MODEL" is that it has no superior in the world's markets to-day.

THE MOBILE'S RADIUS OF MOTION.

One of the improvements in the "WESTCHESTER COUNTY MODEL" is a tank made from seamless copper tubing, giving a fuel storage capacity double that in the original Stanley carriage, and equal to one hundred miles' run on smooth, level roads. The MOBILE can travel over any class of road, rough or smooth; but it must be distinctly understood that the rougher the road the more fuel required.

THE MOBILE BUILT TO CLIMB THE STEEPEST HILL ROADS.

The question of steep grades is an annoying one for the average horseless carriage. Not so for the MOBILE. It can climb on a fairly made road up a fourteen per cent. grade (which is considered a pretty steep country road) at the rate of fifteen miles an hour. During last summer Mr. Freeland O. Stanley and his wife ascended the long, steep road up Mount Washington in two hours and twenty minutes.

IN THE MATTER OF COMFORT.

The MOBILE is perfectly smooth in operation. It moves without jar or vibration of any kind. When in motion, the products of combustion are carried underneath the carriage, and neither heat nor odor of any kind arises. The machinery is noiseless, except in climbing stiff grades, when a slight puffing is audible, but nothing in the least degree objectionable.

There are more than a dozen improvements in the present carriage over the Stanley carriage as originally put out. The first and most important of these is in the engine. The second relates to the gasoline tank, which now holds double the quantity of oil formerly carried. A seamless copper tube, very strong in construction and elliptical in shape, secures this much to be desired result.

Another marked improvement is in the ball bearings of the engine, which are one-half inch instead of three-eighths inch as formerly, experience showing that the increase of strength thus obtained is an item of great importance.

The other improvements are largely in details of construction, no effort in time or money having been spared to work out the most perfect results. The question is frequently asked, "What guarantee is given to the intending purchaser?" To this we reply that we guarantee our materials and workmanship to be the best that money can produce. Our factory, however, is open to the inspection of intending purchasers, and it only needs a visit to the various departments to satisfy an expert as to the excellence of the work being turned out.

The claims which the MOBILE makes upon the public confidence may be briefly summed up as follows:—

First. The lightest, most compact, best designed and most perfect horseless carriage now before the public.

Second. The highest class of materials and workmanship.

Third. Cost—but \$650.

Fourth. Simplicity in construction odorless when running, and almost noiseless.

Fifth. It can speed at a gait up to thirty miles per hour or follow the slowest truck.

Sixth. It is operated by steam, the standard power of the world, under perfect regulation and test.

Seventh. Its fuel is inexpensive; it carries a supply for fifty to one hundred miles, according to the character of the road, which can be procured at any drug-store at slight expense.

Eighth. It embraces all the latest improvements, and is confidently recommended as the most perfect piece of machinery now on the market.

The probabilities are that not one automobile carriage will be built during the coming season where ten will be required to supply the demand. The impression prevails that there are a great number of horseless carriage factories being erected and that the output will be large during the coming season. The fact remains that there are not in operation in the United States at this time factories capable of turning out twenty machines a day other than the Stanley carriage. After three years of experiment on the part of the Messrs. Stanley, and nine months spent on the construction of a factory, we are only now in a position to turn out carriages on a considerable scale.

A carefully prepared book of instructions will be furnished with each carriage sold, and it is possible for any one with some mechanical knowledge to master the handling of the MOBILE from the instructions therein given. Unmechanical purchasers living at a distance who cannot come to the factory for instructions are advised to secure a careful and competent engineer, a man of good judgment and likely to be thorough, who can master the machine and then instruct the purchaser.



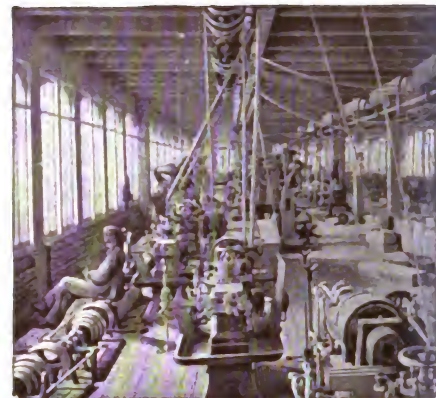
THE HEADLESS HORSEMAN'S BRIDGE AS IT WAS FORMERLY.

man's Bridge" is near by. The mansion was the center originally of the Philipse estate, which Duyvel to Peekskill. It seems proper that here should be opened the manufacture of automobiles, manufacturing operations on the Hudson.

THE LARGEST AUTOMOBILE FACTORY IN THE WORLD.

LOCATED AT KINGSLAND POINT, ON THE FAMOUS PHILIPSE MANOR PROPERTY. THE WORK OF PREPARATION REQUIRED TO BUILD SIX HUNDRED CARRIAGES PER MONTH. HISTORY OF THE DEVELOPMENT OF THE HORSELESS CARRIAGE IN THE UNITED STATES.

THE first MOBILES were turned out at the factory of THE MOBILE COMPANY OF AMERICA, at Kingsland Point, on the Hudson, during the month of March. Six months before, two hundred and thirty acres of the famous Philipse Manor property, having nearly a mile of river frontage on the Hudson and bisected by the New York Central Railway, was purchased with the idea of erecting there an automobile factory of such a nature that the cost of production could be brought to the lowest possible figure. While the factory was in course of erection a corps of engineers and experts, under the direction of the Messrs. Franch and Freeland Stanley, was engaged in strengthening and improving the carriage.



NORTH END MOBILE COMPANY'S FACTORY.

INSPECTION OF VEHICLES.

The MOBILE carriage, "WESTCHESTER COUNTY MODEL," may be found from 9 A. M. to 6 P. M. in front of the New York Offices of the company, Fifth Avenue and Forty-second Street, and the Times Building.

Intending purchasers are invited to visit the factory at Kingsland Point, Tarrytown-on-the-Hudson, where instruction will be given in handling the carriage.

KINGSLAND POINT WELL ADAPTED FOR TRYING AUTOMOBILES.

The Philipse Manor property contains many beautiful roadways, steep, level, good, and some bad, so that the purchaser or intending purchaser will find it admirably adapted as a place to try automobiles.

Tarrytown is a little more than half an hour's run from New York by the fast trains. Of the fifty-nine accommodation trains which stop at Tarrytown station, fourteen each day stop at Kingsland Point upon application to the conductor. Kingsland Point itself is considered to be one of the two or three most beautiful places on the Hudson. It stands well out on the Tappan Zee, with Grant's Tomb visible on a clear day to the south, and a great stretch of water to the north off into the Highlands. The place is full of historic memories. The original Philipse Manor and mill, more than two hundred years old, are still standing. The "Headless Horseman" embraced two hundred square miles, and reached from Spuyten Kill, for here were begun more than two hundred years ago man's

THE "MOBILE" COMPANY OF AMERICA

JOHN BRISBEN WALKER, President.

WILLIAM A. BELL, Vice-President.

FACTORY:

Kingsland Point, Tarrytown-on-Hudson, N. Y.

NEW YORK CITY OFFICES:

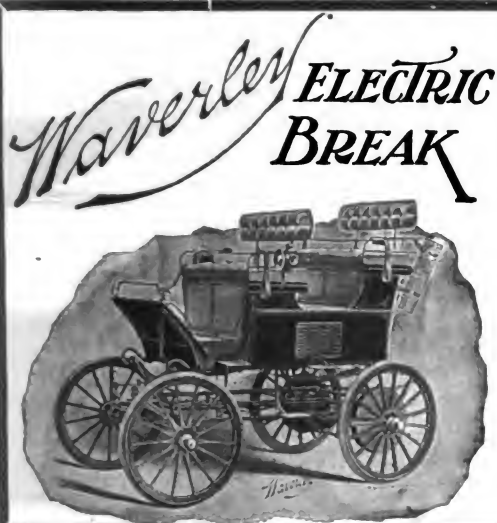
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OUR LINE COMPRISES 18 MODELS, FROM A TWO-PASSENGER RUNABOUT TO A NINE-PASSENGER BREAK, ALL GUARANTEED MECHANICALLY AND ELECTRICALLY. WE REMOVE ALL DOUBTS AS TO EFFICIENT DURABILITY BY SUPPLYING A CONTRACT TO MAINTAIN BATTERY FOR FIVE YEARS.

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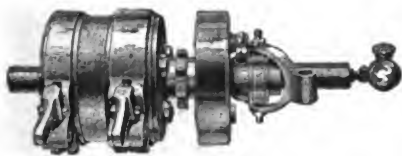
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IT IS COMPACT, NEAT AND STRONG.
IT IS ABSOLUTELY DUST PROOF.
IT HAS TWO SPEEDS AND A REVERSE.
ITS SPEED RATIO MAY BE ARRANGED AT WILL.
IT HAS AN AUTOMATIC OILING DEVICE.
IT MAY BE READILY ADAPTED TO ANY MOTOR CARRIAGE.
IT IS UNQUESTIONABLY THE MOST PERFECT GEAR IN EXISTENCE.

2 Sizes. No. 1. 4 to 5 H. P., 35 pounds.
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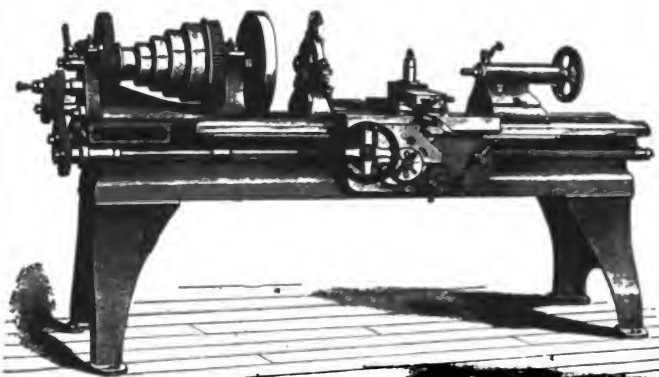
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Machine Tools

For Automobile Trade.



ENGINE LATHE.

DRILL PRESSES, SHAPERS, PLANERS, ETC.

NEW CATALOGUE ON APPLICATION.

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The "*Locomobile*" Company of America is now ready to turn out in large quantities a new and improved "*Locomobile*" which is the result of one year's experience.

1,000 "*Locomobiles*" are in actual use, all giving excellent satisfaction.

The following are some of the most important changes and alterations which have been made in the new model:—

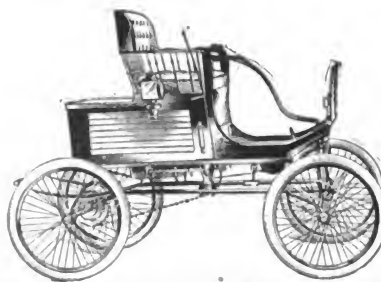
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American Automobile and
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Paris.
E. J. Halsey, 52 Sussex Pl.,
So. Kensington, London.

Address all inquiries to

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BUNDY ACETYLENE GAS LAMPS.

ONE GRADE—HIGHEST.

THEY ARE MADE WELL.

THEY LOOK WELL.

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THE ONLY COMPLETE LINE IN THE WORLD. WRITE US.

BUNDY LAMP CO., Elmira, N. Y., U. S. A.

THE STYLISH-OHIO Electric Carriage Light

OPERATED BY SERIES-MULTIPLE DRY BATTERY

Solves the Problem of Portable Lighting, and gives to us
a Driving Lamp that is at once



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Eight or ten of our improved dry cells are arranged in a neat case, in series-multiple, so as to obtain long life, and no charging or other attention is required. The outfits are furnished ready for use and can be attached to any carriage in one minute. The light can be turned on and off at will. The Reflector, a true parabola, magnifies eight times the three-candle lamp, causing it to throw its rays two hundred feet. The Lamp is six times the efficiency of ordinary incandescent lamps, taking only one-half watt to the candle-power. At an e. m. f. of 7 volts only .20 of an ampere is used, a fine light produced, and imperceptible use of the battery readily recuperated by a day's rest.

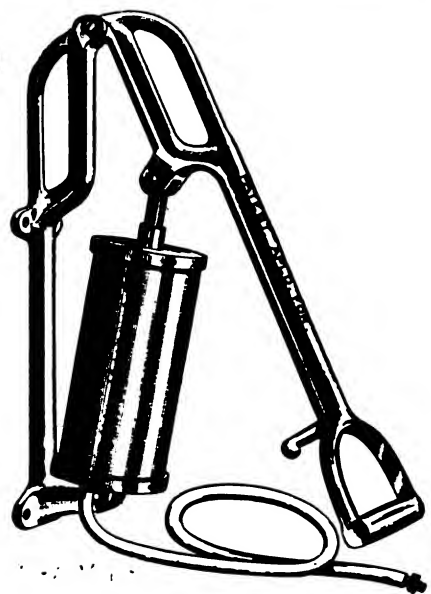
\$3.95 This outfit consists of Lamp, Reflector, Combination Bracket for attaching to carriage, Conductor Cord, Connectors and 8-cell Dry Battery in neat case, ready for use. Our lowest price for this outfit is \$3.95; two for \$7. *Catalogue free.*

Ohio Electric Works, CLEVELAND, OHIO.

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Automobile Tires.

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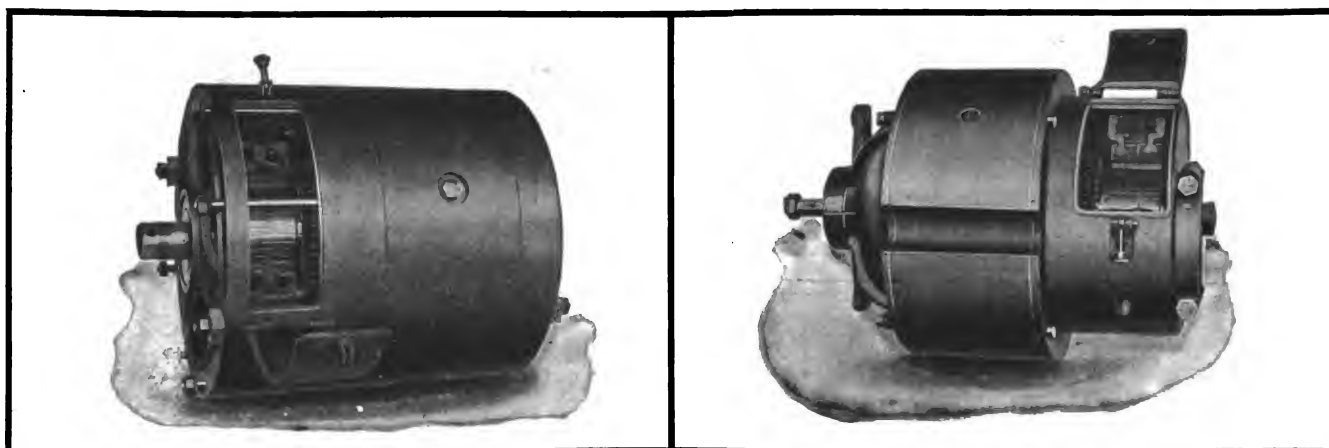
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MOTORS FOR AUTOMOBILES

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Motors designed to suit the individual requirements of manufacturers. Our Automobile Motors are running to-day on hundreds of motor vehicles and are giving universal satisfaction.

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A SPECIAL OIL FOR SPECIAL USE
ADAPTED FOR STEAM OR GASOLINE CARRIAGES
A CLEAN SMOOTH LUBRICANT FOR CYLINDERS
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G. E. HALL
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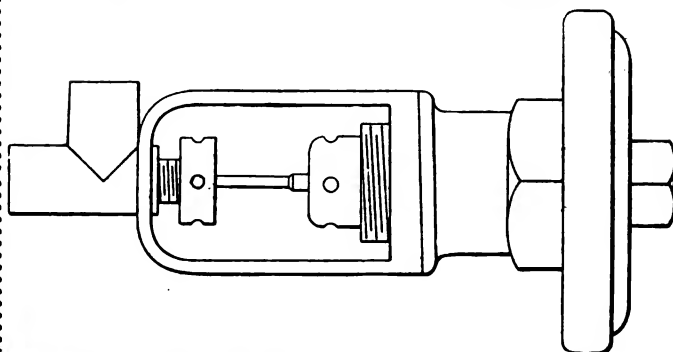
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SAMPLES FREE.

Telephone, 1846 Spring.

Locomobile and Steam Vehicle Fittings.



GASOLINE Regulators and Burners, Water Level in Boiler Regulators, Pin Valves, Check Valves, Safety Automatic Shut-off Valves, Gauges, Injectors, and a full line of everything in fittings used in constructing a steam carriage, including Boilers, Engines, Mufflers, etc.

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Address all Communications
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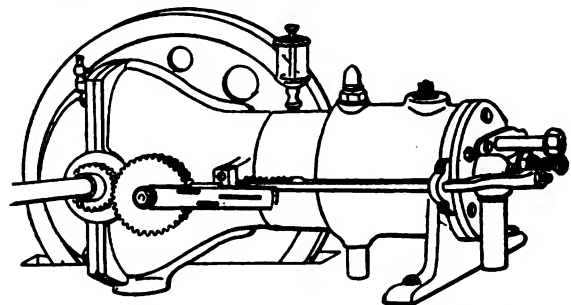
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FOREIGN REPRESENTATIVES.

ENGLAND.—R. Applegarth, 11 Queen Victoria st., London, England. Subscription price, 12s. 6d., or \$3.00.

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and its day and corresponding classes. Then, too, there is the better knowledge possessed by users of the mechanical construction, which has led to the production of novelties, and the more general entry of ladies as buyers. This latter feature has shown its effects most strongly in colors and combinations, while the carriage trade journals, through the publishing of technical information, correct drawings and discussion on topical subjects, have created increased interest and stimulated study along artistic and mechanical lines. The one weak spot is the lack of skilled mechanics. In the artistic lines we are better equipped than ever before, and new and higher planes are being reached, but we must have more skilled men, if we are to keep the mechanical department up to the artistic. The workman of to-day is surrounded by conveniences such as were never dreamed of a half century ago. Factories are being built with an eye to architectural effect, and the interiors are fitted up to please the eye as well as to improve the working facilities, thus creating every incentive for advancement, and we can now look ahead with a feeling that the improved surroundings will further stimulate effort, and that the art of carriage building will hold the advanced position that its close relationship to higher civilization warrants.



New York's Speedway.

IN our account of the speedway parade of light horses and road rigs we have illustrated some views of the speedway, which extends from One Hundred and Fifty-third street northward along the west bank of the Harlem River for a distance of three miles. This beautiful road, fitted for speeding the trotting horse, is but little known as yet, even to the citizens of the great city, but gentlemen who for years past have had no place where they could speed their roadsters quickly saw its beauties, and now no more attractive sight is offered than that of the speedy driving on a pleasant afternoon, where friendly contests take place, where every protection is given to the light road rigs, and where the only speed limit is the highest the horses can make before light road vehicles. Ample provision is made for sightseers, so all who admire the American trotter or pacer can participate in the sport. The great parade on May 5 was a revelation to all, and thousands saw this beautiful drive on that day for the first time. The fixed determination of the Park Commissioners to make the speedway a haven for the fleet roadsters makes it an ideal spot, and the man must be selfish indeed who attempts to intrude any other class of vehicle. The opening of this course has stimulated the purchase of fast horses as nothing before ever did, and in like manner it has increased the demand for light road wagons and light harness. It is estimated that

The Influence of Artistic Surroundings.

THE influence of artistic surroundings is nowhere more marked in connection with manufacturing than in the carriage industry. In the one factory everything grows, as it were, on artistic lines, while in another all is crude and extravagant, and yet each individual workman could give satisfaction in either place. Twenty-five years ago one could count on his fingers almost, if not quite all, the carriage factories in this country that could lay claim to building really artistic work, and these in a great measure won their reputation through closely following the best products of the foreign workshops. Since then the number has increased to the hundreds and even more, if we take the highest standard at that time as the starting point, but the improvement has been all along the line, and the present highest as much outranks the past as does the medium of to-day the medium of the past. Several forces have worked in concert to bring about this result. The first is the impetus given by the opening of the school for carriage draftsmen

the value of the speedy horses seen on the speedway on the day of the parade was not less than \$1,500,000, to which must be added at least \$250,000 as the value of vehicles, harness and other equipments. These figures are not excessive, and they show how willing our people are to invest in the horse and carriage for pleasure, when they can be protected in the use of the same. Other cities should follow the example of New York by providing exclusive roadways for fast horses, where gentlemen can congregate in the most exhilarating and healthy of all out-of-door pastimes. With such speedways there will come to each an increased demand for light vehicles and harness, as well as speedy horses, and business and pleasure will be enhanced thereby.



Antagonizing the Isthmian Canal.

DURING the course of a speech delivered by C. P. Huntington before the Chamber of Commerce, of Galveston, Tex., the speaker took the opportunity to denounce the building of the Nicaragua Canal, and, by conjuring with figures, to show that the United States government would be the loser financially by building this canal. It is unfortunate that selfish motives so sway a man's views that he cannot look beyond that which immediately concerns his own interests. Mr. Huntington was making a special plea for the Southern Pacific Railroad, of unsavory memory, but instead of treating the road on its merits he attacked the canal, knowing that its completion would draw much of the Pacific business, and his road would be compelled to reduce its rates or lose its share of the cross-continent traffic. Had this speech been for local effect only it would have deserved condemnation by business men, but as it has been printed in pamphlet form, and is being distributed throughout the country its real intent is shown, and the broad minded business man who is not bound down by the value of his holdings in a railroad should be put on his guard by this attempt to stifle one of the greatest needs of the nation and throw the entire Pacific and eastern carrying trade into the hands of railroad officers, who can levy such charges as they see fit, or compel the carrying many thousands of extra miles over ocean lines. We hope the United States Senate will pass the House Bill, and settle the matter by pledging the government to the building of the canal.



States Competing in Trust Making.

NEW JERSEY's monopoly in creating trust companies has aroused competition, and unless a trust is formed which will include New Jersey, Delaware, West Virginia and Maine, there is reason to believe that Trenton will lose much of its business, and the pigeon holes wherein corporations keep their records for reference will be labeled "To Let." The originals, we believe, in the business were West Virginia and Maine, but neither of these States inspired the necessary enthusiasm, and some one discovered that by a liberal interpretation of the law New Jersey offered attractive privileges, and business became brisk. Delaware, seeing possibilities, entered the field, and by a liberality that permitted the incorporators to make about any arrangement they saw fit, providing the State's fees were paid, has started an opposition trust machine, and hopes to gather in a fair share of the spoils. This matter is now becoming serious, and it may be necessary for our political platform makers to embody in their anti-trust planks one that will prevent States combining as a great trust for the purpose of creating other trusts.

Automobile Scorching.

AUTOMOBILE clubs, manufacturers and others who are honestly interested in the success of automobiles should take active steps to suppress the scorcher. If this *genus homo* is allowed to have his own way he will soon succeed in bringing the motor into such disrepute that there will be legal enactments that will tend greatly to retard their introduction. This has already occurred in France, and now even in Paris, where the foot passenger who is injured by a vehicle on the streets is punished for being in the way, restrictions have been thrown around the automobile scorcher that threaten the popularity of the vehicles. We have laws that regulate the speed of horses and bicycles on city streets, and the owners of automobiles would be as quick to punish the offenders as any other, and yet thus far they have taken no steps to check the scorcher idiot who runs his motor at its highest rate of speed, regardless of danger to people on crowded streets. We know there is an exhilaration in speeding over the highway, but no man has a right to purchase his own pleasure at the sacrifice of human life. It is in the power of automobile clubs to restrict speed on city streets to a safe limit, and in time we may have automobile speedways, where there are no restrictions, but that time will not come if the fool scorcher is allowed to run as he will. Let us have reasonable laws regarding the speed of the motor, as we now have regarding the horse and bicycle, and as the public become accustomed to the new vehicle, and learn that life or limb is not endangered by it they will welcome it as another addition to the means for contributing to pleasure and business.



A Word to Sleigh Builders.

EARLY summer is the time to look through the sleigh market and decide as to the number to be built for the winter of 1900 and 1901. The last season was not as profitable to sleigh manufacturers as was hoped for. Even in the North and Northwest the sleighing season was shorter than usual, while throughout New England and the central belt there was but little snow until after the holidays, and the season was exceptionally short. The winter of 1898 and 1899 was an exceptionally good one for the sleigh trade, and stocks in the hands of manufacturers and dealers were pretty well cleaned out. This led to heavy orders for last winter, and an unusually large stock was put upon the market, but unfavorable conditions intervened, and in almost every section of the country dealers carried over large stocks. A conservative estimate puts the unsold stock at about 30 per cent. of the products. This 30 per cent. is a fairly large stock to start with, while the unsatisfactory trade of last winter will make dealers cautious about stocking up, and it will be good business for manufacturers to move cautiously. If they will correspond with their customers they can learn what percentage is being carried over from last year and the character of those unsold. This will enable the manufacturer to gauge his output and prevent an additional accumulation. It is far better to lose a few sales for want of stock, than to carry over 2 per cent. of the product. Looking at it from every standpoint we believe that a cutdown of from 25 to 30 per cent. from the output of last year will prove advantageous to builders and dealers, even if the winter is a favorable one. In any event it will be well to canvass the field thoroughly before settling upon the number to be built. There is no more uncertain trade than the sleigh. The man who so gauges his output each year as to sell without forcing the market, is the one who profits by the business. He who overstocks heavily loses more in one bad season than he can make in three good ones.

Get Ready for the C. B. N. A. Convention.

WE desire to call attention to the official circular, published in another part of this month's HUB, announcing the twenty-eighth annual meeting of the C. B. N. A., which will be held in New York City during the week beginning October 15. The hall where the exhibition of materials will be held is large, well lighted, has extra high ceilings, is easily accessible, and all on one floor. Every surface railroad either runs its cars within a few hundred feet of the hall, or transfers its passengers, without extra charge, to those that do. The West Side elevated trains all stop at Sixty-ninth street station, close to the hall, while passengers coming into the Grand Central Depot are but ten minutes' ride away. The advantage of one large hall, and no long flights of stairs or elevators will be appreciated. The executive committee hope to make the exhibit the largest and best ever held by the association, while the convention itself, which will be held on the 16th, 17th and 18th, will be of a character to interest all. All meetings will be open to members and visitors alike, whether manufacturers, dealers or interested spectators. The time intervening between now and the date of opening is none too long in which to get ready, and those desiring to exhibit carriage materials to prepare full lines of samples, and to arrange for their exhibit in the best possible manner. We are led to believe that the exhibit will be unusually large, and as New York City is a most delightful place to visit, especially in the month of October, we anticipate the largest convention ever held by the C. B. N. A. It is yet early to arrange a program for the entertainment of visitors, but all can be assured that the New York local committee will, with the aid of the executive committee, do their best to make the convention of 1900 an ideal one in every respect.

TWENTY-EIGHTH ANNUAL MEETING CARRIAGE BUILDERS' NATIONAL ASSOCIATION.

ANNOUNCEMENT.

THE twenty-eighth annual meeting of the Carriage Builders' National Association will be held in New York, October 16, 17, 18, 1900. The annual exhibition of parts of carriages, wagons and automobiles, gears, wheels, springs, axles and material used in their construction; harness, horse equipments, etc., will be held in St. Nicholas Hall, Columbus avenue and Sixty-sixth street, beginning with Monday, October 15, and continuing through the week.

St. Nicholas Hall is a very large room, containing 20,000 square feet. It has a high ceiling, is well lighted in every part, and, being on the second floor, is approachable by a very wide and easy entrance. It is one of the finest, if not the finest, places we have ever been able to secure for exhibition purposes.

The building is easily accessible from all parts of the city, both by the elevated and surface railways. The Sixth avenue and Ninth avenue elevated roads have a station at Sixty-sixth street, close by the hall, and the Broadway-Columbus avenue and the Broadway surface cars pass within a few feet of the entrance. Other street railways run very near, and by transfer one can reach the hall from any part of the city for a single fare. The distance is only fifteen minutes from Fifth Avenue Hotel and ten minutes from Forty-second street.

Adjoining and near to the hall are numerous cafés and restaurants, as good as can be found in the city. It is the purpose of the committee to arrange for a very large convention and exhibition. They intend that the exhibition shall be the finest that has ever been held. To these ends they earnestly ask your co-operation.

Full particulars as to space and other details will be arranged shortly and sent to you by mail.

Yours truly,

F. B. JUDKINS, *Chairman.*

D. M. PARRY.

M. F. LANE.

LOWE EMERSON.

DANIEL T. WILSON.

FRANK L. WRIGHT.

C. A. CARLISLE.

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C. D. FIRESTONE.

MORRIS WOODHULL, } *Ex-Officiis.*
HENRY C. MCLEAR, }

Executive Committee.

Description of Latest Styles.

OLD COMFORT SLEIGH.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 467.)

THE two passenger sleigh illustrated by Fashion Plate No. 467 is built upon the "Old Comfort" lines, with modifications which tend to give it a better appearance. The runners are sufficiently heavy to insure stability, while the tread is long enough to ride easy. The knees are low and strong. Make up the body on sills framed together, and seat rail standards and back corner pillars. Cut the top of the seat standards to a sharp sweep, so as to throw the seat end well out at the top, thus improving the appearance and increasing the seat space. Use $\frac{3}{8}$ in. side panels.

Paint the body panels coach vermilion; dash posts, edge of panels and corner pillar above the side panel black; runners, dark willow green; ironwork, black.

Trim with drab or gray whipcord.

GENTLEMAN'S DRIVING SLEIGH.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 468.)

FASHION PLATE No. 468 illustrates a high driving sleigh for the heavy high stepping harness horse, and takes a place among sleighs corresponding to that of the tilbury among vehicles. The body is set two feet from the ground, and is made extra deep, necessitating the use of an extra platform, which is made separate from the body. The side panels flare three inches on each side at the top of the stanhope pillars, and two inches at the elbows. If solid stanhope pillars are used no inside framework is necessary at that point, as the seat rail can be mortised into the pillars. If the stanhopes are indicated by moldings, then inside posts are necessary. The corner pillars are set in from the back corner to show a molding $\frac{1}{4}$ inch deep down to where the side panel begins to take an outward sweep; below this the panel is straightened down to a point directly above the outside of the rear beam. An inside molding is nailed on over the joint and finished off flush with the end of the panel down to where it leaves the curved line. The back cross molding has its lower edge on a line with the arm rail, the lazyback being solid above that point. The runners should be $1\frac{1}{4}$ inch deep, $1\frac{1}{8}$ inch tread.

Paint the side panels olive green; back rail, dash, back and stanhope pillars, coach red; extra foot tread, black; cutunder and bracket panels, black; moldings, fine lined black; outside of knees, beams and runners, coach red; inside, black; all ironwork, black.

Trim with fine quality drab Bedford or whipcord. Pom-pons, black and red.

FAMILY SLEIGH.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 469.)

FASHION PLATE No. 469 illustrates a convenient, comfortable and easily built family sleigh. The under part is the plain wood knee, beam and single bend runner, with a strong fender bolted upon the top of the beam ends. The body is made up in the same manner as the "democrat" wagon body, with the additions of the heavy dash posts. The moldings shown may be nailed on, or the painter can simulate moldings by striping.

Paint the panels inside of the moldings moss green; outside of moldings, dark olive green; stripe, $\frac{1}{4}$ inch wide, black, edged with a fine line of red. Woodwork of under part, deep American vermilion; ironwork, black.

Trim with dark green cloth or gray mixed whipcord.

SURREY SLEIGH.Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 470.)

FASHION PLATE No. 470 illustrates a stylish sleigh, with body built upon surrey lines and hung upon bob runners and springs. This mode of hanging insures comfort to the rider as none other does, and gives a stylish appearance to the vehicle. The body should be built of framework and grooved panels, giving the quarter panels a good fullness.

Paint the quarter panels and dash panel dark olive green; seat pillars and moldings, coach red; rocker, black. Fine line the pillars and moldings red. Woodwork of bobs, coach red; ironwork, black. Fine line the red with black, and the black with red.

Trim with dark green broadcloth or fancy whipcord. Use brass tubing for plume standards; plate handle ends, brass, but cover grip part of handle with black morocco.

BUSINESS SLEIGH.Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 471.)

THE business sleigh shown by Fashion Plate No. 471 will prove not only a good vehicle for the business man, but it will serve well as a pleasure sleigh. The body should be built with an express body frame, but it may be of $\frac{1}{2}$ inch solid panels, with the chamfered moldings nailed on.

Paint the panels the new brick red; moldings, black, picked out with striping vermilion. Woodwork of runners, dark coach red; ironwork, black. No striping on the running part.

Trim with dark green cloth or gray whipcord. Line inside of seat panels and cover the seat rails with russet leather.

DELIVERY SLEIGH.Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 472.)

THE delivery sleigh illustrated by Fashion Plate No. 472 is designed for general delivery service. The body is built strong, and is made roomy, the back end being furnished with a tail gate, and is hung on stout bobs. The main point aimed at is strength, but the proportions and suspension are such as to present a neat and attractive appearance.

Paint the woodwork throughout dark coach red; all irons, black. Stripe the body black.

Trim with imitation leather.

CABRIOLET.

(See "Latest Styles.")

PLATE XLV. illustrates a popular pattern of cabriolet, although not new. It was one of the leading styles at the New Jersey seaside resorts last season. It was trimmed with light drab broadcloth, the predominating colors being dark green body, red or green gear.

IMPERIAL LANDAU.

(See "Latest Styles.")

PLATE XLVI. is a half tone illustration of the landau in which Admiral Dewey rode on the day of the parade in his honor in Chicago, May 2. The full four-in-hand is shown on our outside cover page. The landau was built by C. P. Kimball & Co., of Chicago, for Arthur J. Caton, of that city. The body was painted dark blue, picked out with a light blue. The interior was trimmed with silver drab cloth, and the driver's seat with blue cloth. The Admiral and Mayor Harrison occupied the rear seat. The team, four browns, were fitted with brass mounted harness, making an almost faultless turnout.

PARAGON SURREY.

(See "Latest Styles.")

PLATE XLVII. illustrates the "Paragon" surrey, built by Osgood Morrill, of Amesbury, Mass. It is equipped with the Morrill &

Wells patent axles and springs. Hung on three springs and closely coupled. The seats are 33 by 17 in.; backs, 20 in.; wheels, 36 in., pneumatic tire, 2 in. It is fitted for canopy tops, and should be a good seller.

NO. 100 SURREY.

(See "Latest Styles.")

PLATE XLVIII. illustrates the Flint (Mich.) Wagon Works' No. 100 surrey, a large, roomy and desirable four-passenger carriage, fitted with long distance axles, quick shifters, canopy top, fringe and lining to match trimming of seat. Springs, five leaf front, six leaf rear; wheels, Sarven, 40 and 44 in., $\frac{3}{8}$ or 1 in. tread. Painting, body, black, red decoration; gear, Brewster green, three line stripe. Trimming, whipcord, green or blue cloth; oil burning lamps; double dress fenders.

BAND WAGON.

(See "Latest Styles.")

PLATE XLIX. shows a band wagon built by Walborn & Riker, St. Paris, O., for the famous Gentry Bros.' Dog & Pony Circuses, being the second one built for them in the past few months. The capacity is for fourteen musicians, and in size it is somewhat under the usual circus wagon. However, it is amply roomy for the number of musicians above designated. The carvings are in relief, being quite bold; all carvings and moldings are finished in pure gold leaf. The flat surface of the body is English vermilion. The gear is painted English vermilion, very highly ornamented with pure leaf and fancy striping. On the rear of the vehicle appears the name "Gentry," carved in high relief, together with head of a dog and scroll carvings. The arrangement for hitch is for eight to twelve ponies, graduating from medium or large ponies down to smaller ones. The upholstering throughout is of the best quality, maroon leather, all spring cushions.

GENERAL LAFAYETTE'S CARRIAGE.

(See "Latest Styles.")

PLATE L. illustrates the Lafayette carriage as it now appears. As a relic of the old time carriage it possesses special interest; and owing to its having once been the property of General Lafayette it has an historical value. We are indebted to the Studebaker Bros. Manufacturing Co., of South Bend, Ind., for the cut. This company has issued a little pamphlet, in which are portraits of General Lafayette and Washington, together with the carriage, and a condensed history of the general and a description of the carriage. The pamphlet is neatly gotten up, and reflects credit upon the enterprise of this foremost American carriage and wagon house. The carriage will be on exhibition, in the United States government exhibit in Paris.

PONY TRAP.

(See "Latest Styles.")

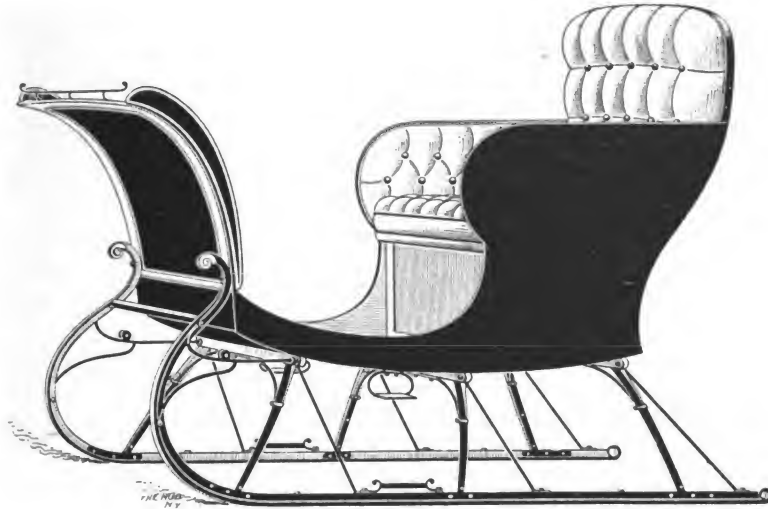
PLATE LI. illustrates a little trap, the right size for a 10½ to 11 hand pony, or a pair of ponies of the same size, built by J. A. Lancaster & Co., Merrimac, Mass. The front seat is large enough to accommodate adults, but the rear seat is for children. When the rear seat is not needed it can be turned under the front seat out of sight. These little traps are painted in bright colors, basketwork sides, whip or Bedford cord trimmings. All parts are put together in the most perfect manner, and the construction is by hand labor; no iron castings or anything cheap about them.

LADIES' SPIDER PHAETON.

(See "Latest Styles.")

PLATE LII. illustrates a spider phaeton with spindle seat, the lady driving being one of the best known lady drivers in the vicinity of New York. The team and vehicle were winners at a late horse show. The harness is French pad, long tug, four leather loops and outside tug clips. The bridle has horseshoe winkers, chain fronts and Hanovarian bits. The whole outfit is neat and stylish.

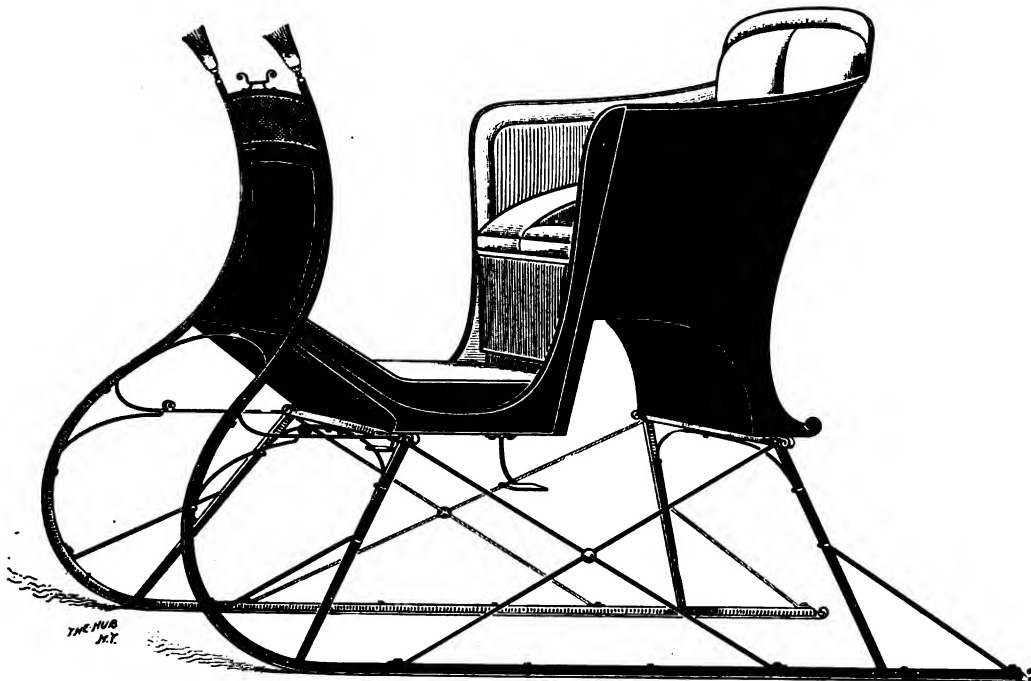
Latest Styles. June, 1900



No. 467 OLD COMFORT SLEIGH. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

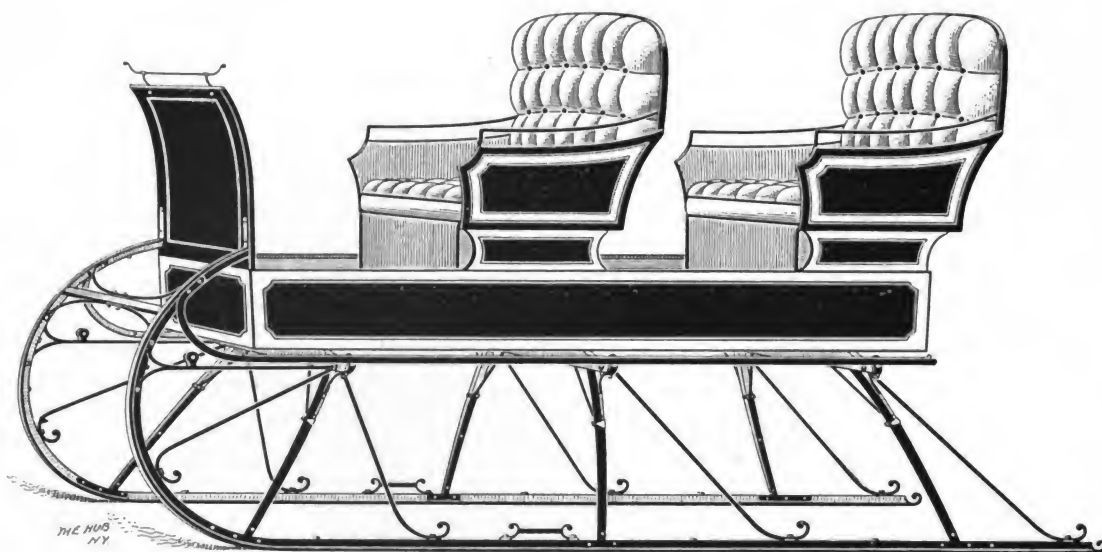
(Electrotype, \$1.25.)



No. 468. GENTLEMAN'S DRIVING SLEIGH. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

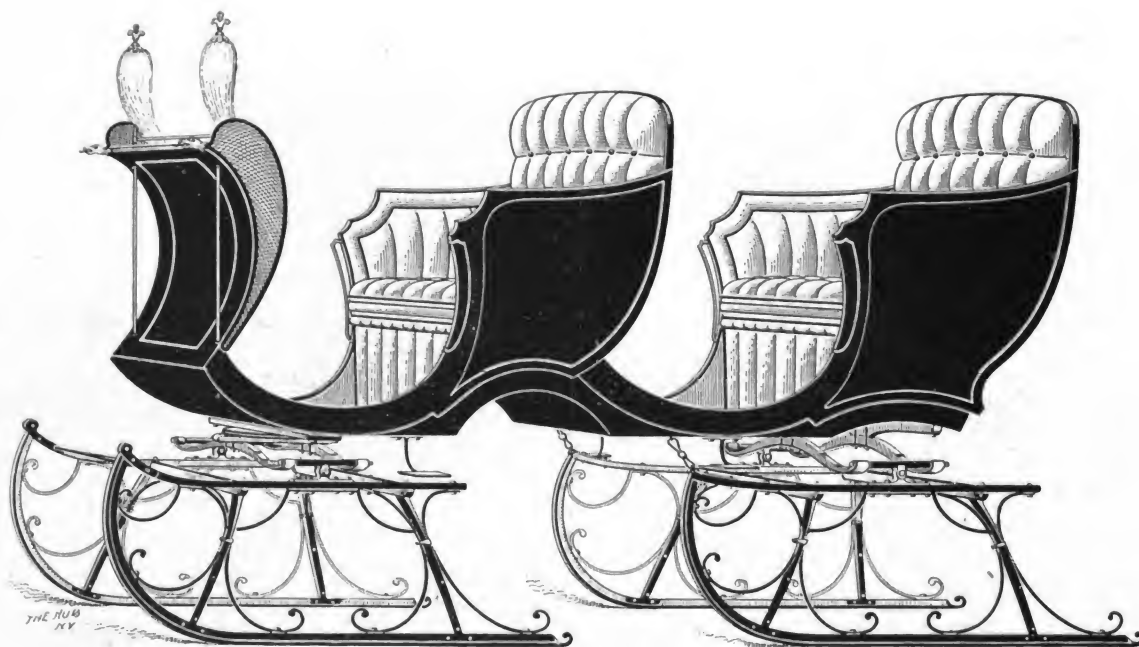
(Electrotype, \$1.25.)



No. 469. FAMILY SLEIGH. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

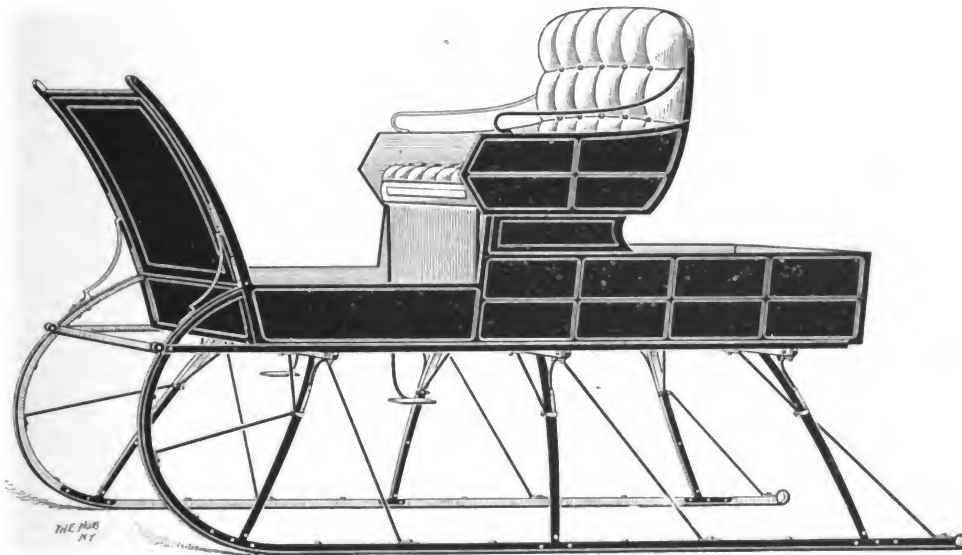
(Electrotype, \$1.25.)



No. 470. SURREY SLEIGH. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

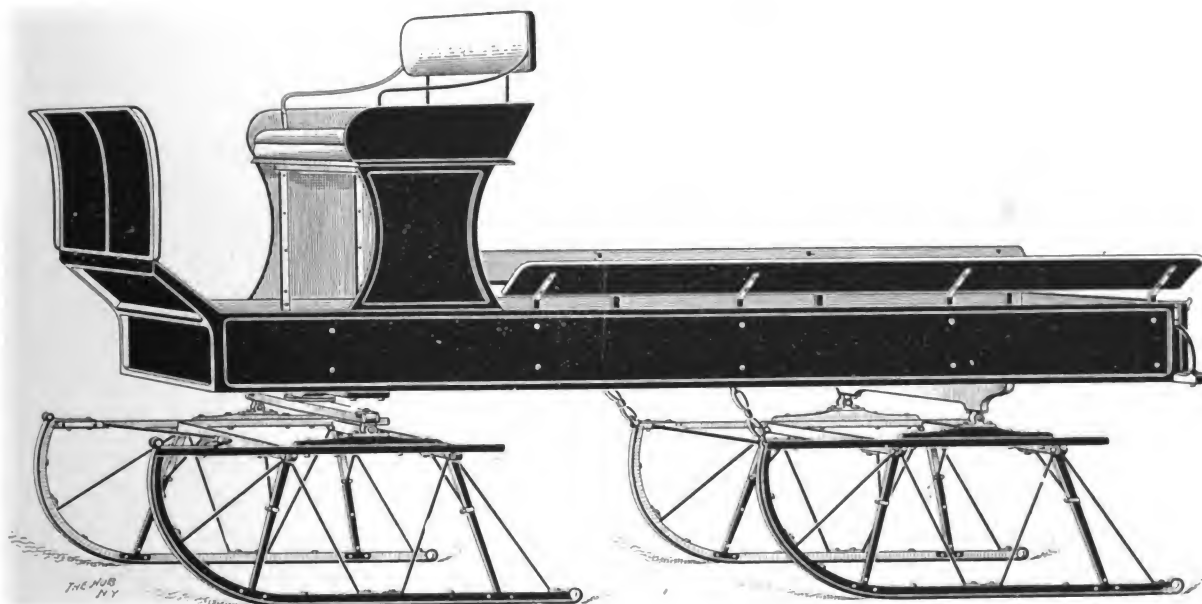
(Electrotype, \$1.50.)



No. 471. BUSINESS SLEIGH. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

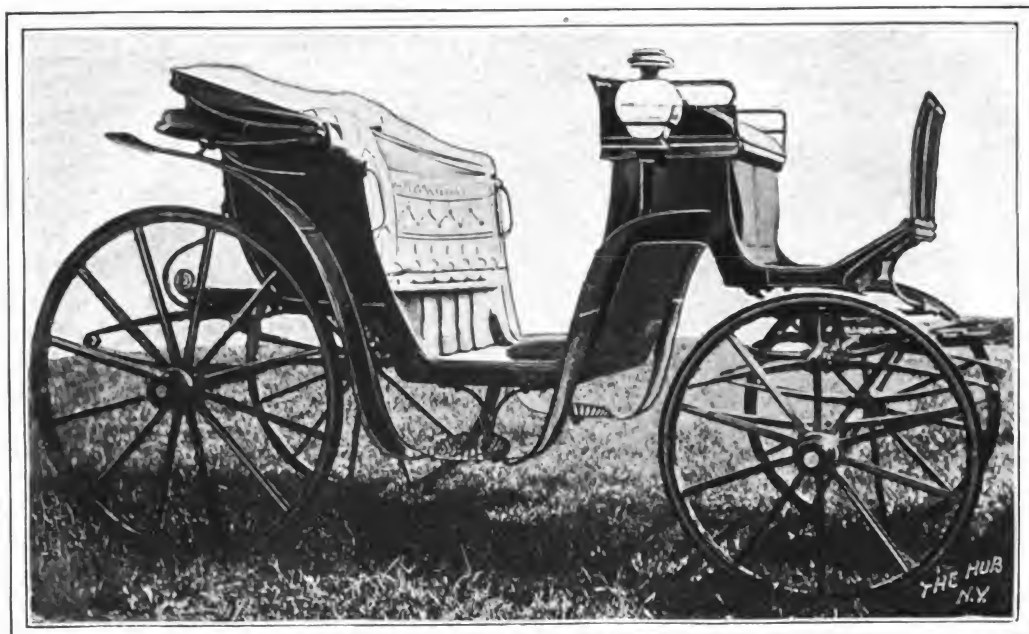
(Electrotype, \$1.25.)



No. 472. DELIVERY SLEIGH. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

(Electrotype, \$1.50.)

**PLATE XLV. CABRIOLET.**

See description under "Latest Styles" in this number.

**PLATE XLVI. IMPERIAL LANDAU.**

See description under "Latest Styles" in this number.

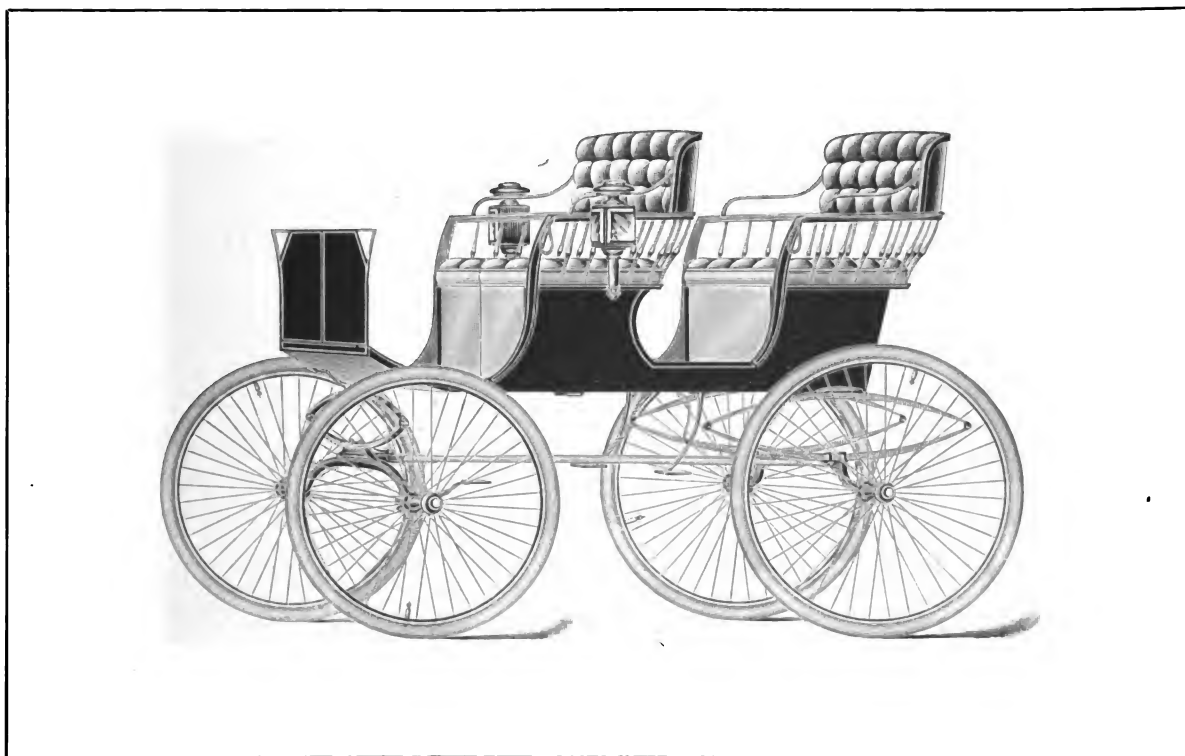


PLATE XLVII. PARAGON SURREY.

See description under "Latest Styles" in this number.

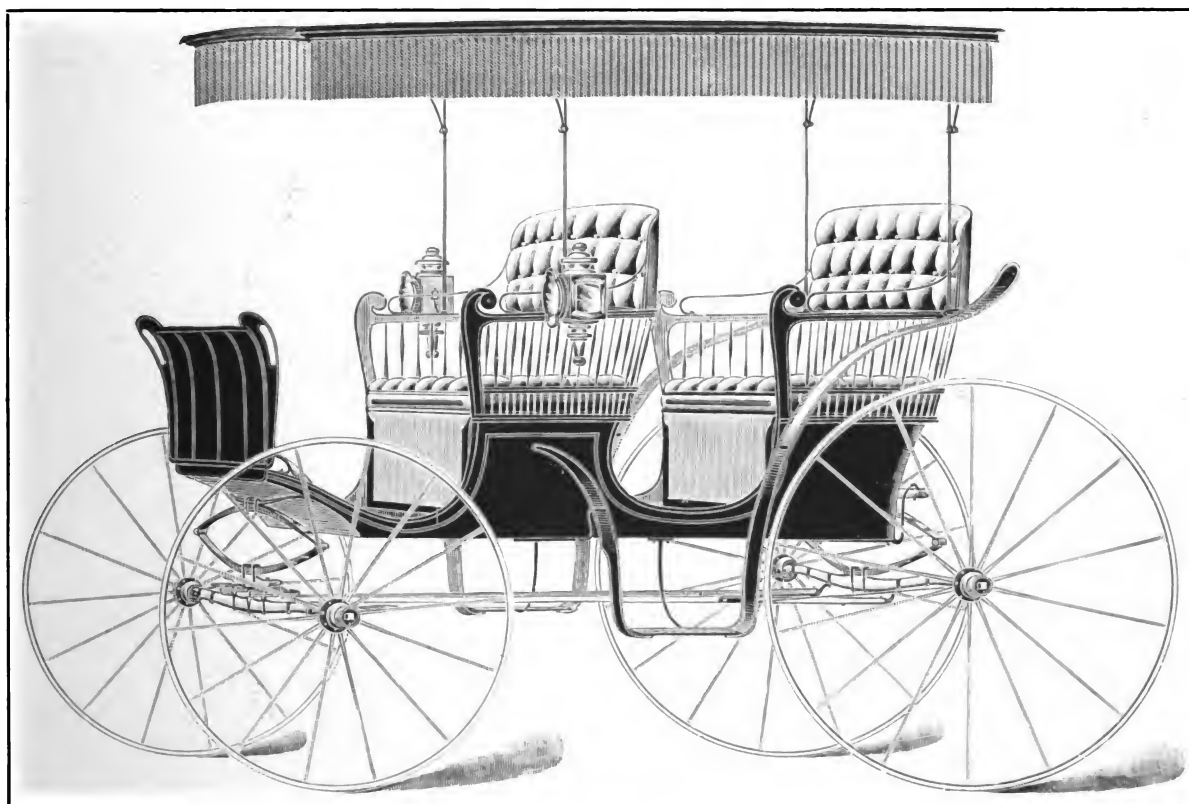


PLATE XLVIII. NO. 100 SURREY.

See description under "Latest Styles" in this number.

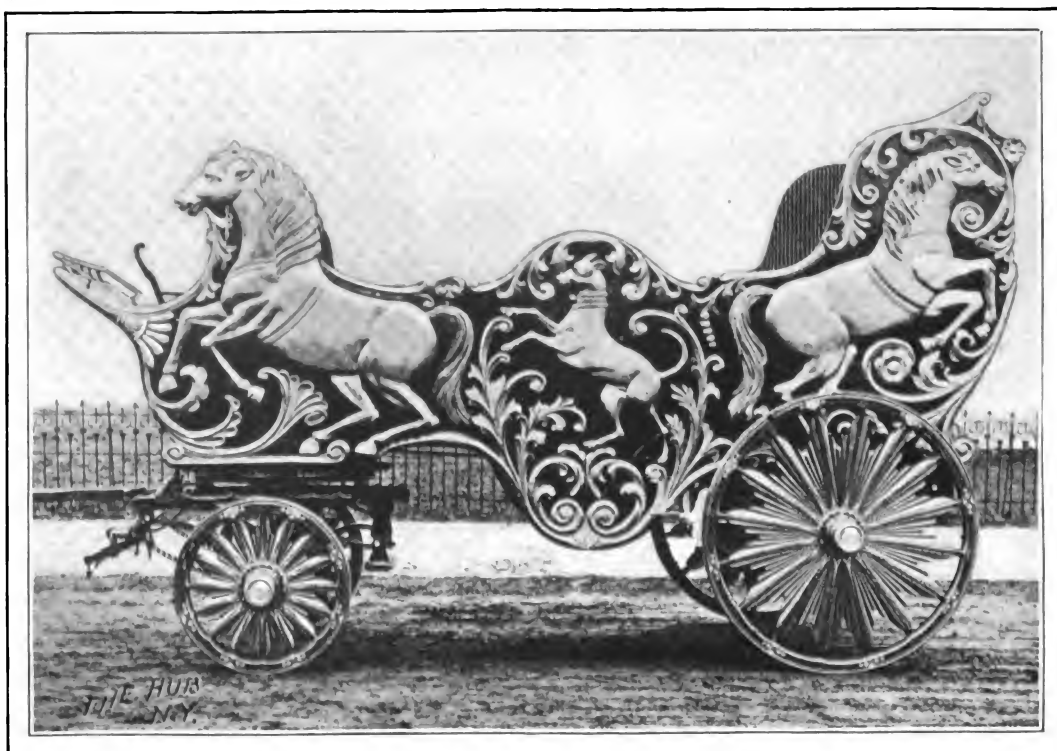


PLATE XLIX. BAND WAGON.

See description under "Latest Styles" in this number.



PLATE L. GENERAL LAFAYETTE'S COACH.

See description under "Latest Styles" in this number.



PLATE LI. PONY TRAP.

See description under "Latest Styles" in this number.



PLATE LII. LADIES' SPIDER.

See description under "Latest Styles" in this number.

(Electrotype, \$1.25.)



SURREY.
Pleasure Riding and Sight Seeing.



LADIES' SMALL VICTORIA.



LARGE VICTORIA.
Pleasure Riding.

WASHINGTON

**ELECTRIC VEHICLE
TRANSPORTATION COMPANY.**

Pleasure and Sight Seeing.



STANHOPE.



MEN'S RUNABOUT.



BALTIMORE & OHIO RAILROAD
ELECTRIC VEHICLE SERVICE,
Washington, D. C.



HANSOM CAB.
Sight Seeing.

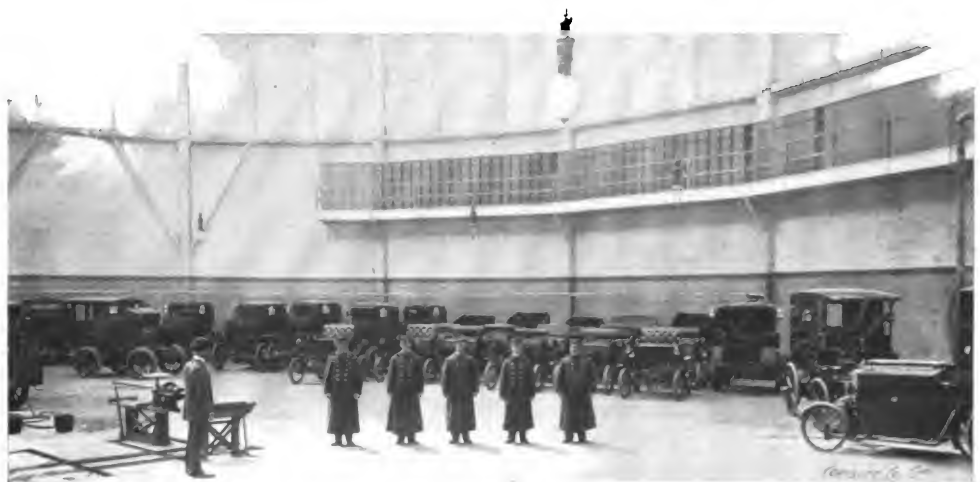


BROUGHAM.
Officials Calling at State Department.



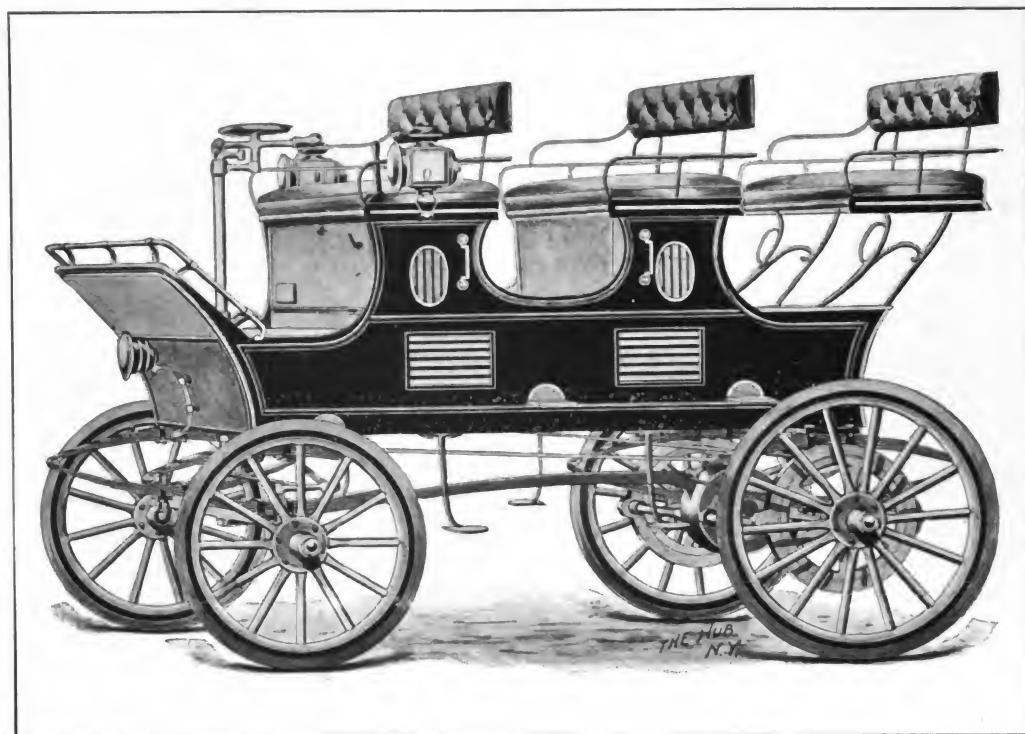
DELIVERY WAGON.

WASHINGTON
ELECTRIC VEHICLE
TRANSPORTATION COMPANY.
Public Service and Business.



DRIVERS REPORTING FOR DUTY.
Undergoing Inspection for Appearance and Condition.

AUTOMOBILE ILLUSTRATIONS.



AMERICAN ELECTRIC VEHICLE CO.'S BREAK.

For description, see Automobile Department.



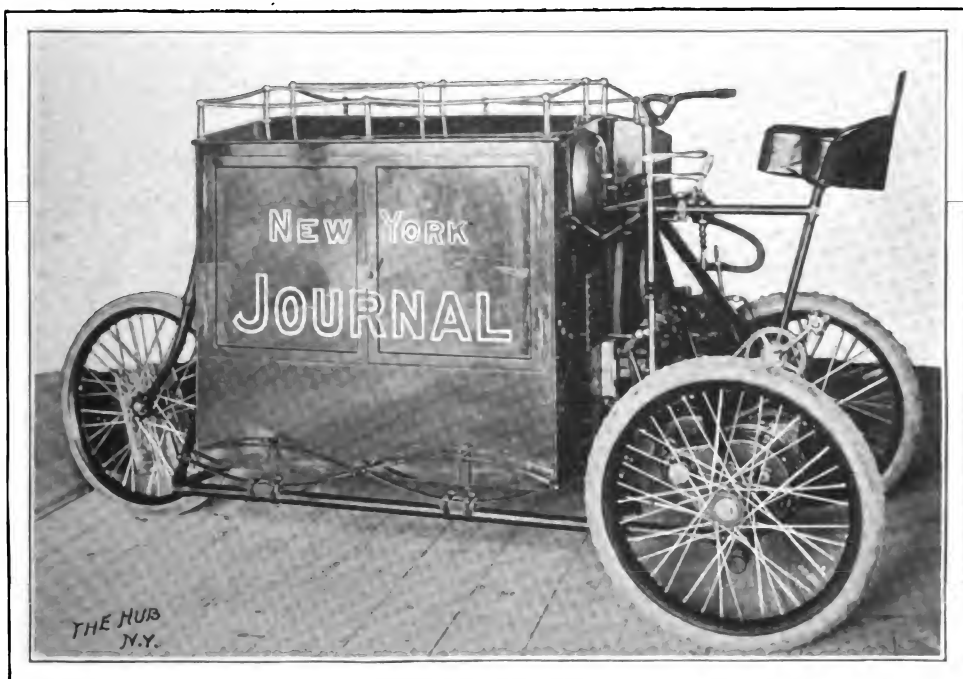
DE-DION MOTOR CARRIAGE.

For description, see Automobile Department.



GASOLINE LIGHT DELIVERY MOTOR.

For description, see Automobile Department.



GASOLINE LIGHT DELIVERY MOTOR.

For description, see Automobile Department.



ELECTRIC VEHICLE CO.'S NEWSPAPER DELIVERY WAGON.

For description, see Automobile Department.



WOODS' MOTOR VEHICLE CO.'S NEWSPAPER DELIVERY WAGON.

For description, see Automobile Department.



QUICK MANUFACTURING CO.'S PHAETON.

For description, see Automobile Department.



WINTON GASOLINE MOTOR CARRIAGE.

For description, see Automobile Department.

**DURYEA TRAPS.**

For description, see Automobile Department.

**DURYEA TRAP WITH CANOPY.**

For description, see Automobile Department.



RIKER EMERGENCY WAGON.

For description, see Automobile Department.



FISHER MOTOR VEHICLE CO.'S TRUCK:

For description, see Automobile Department.

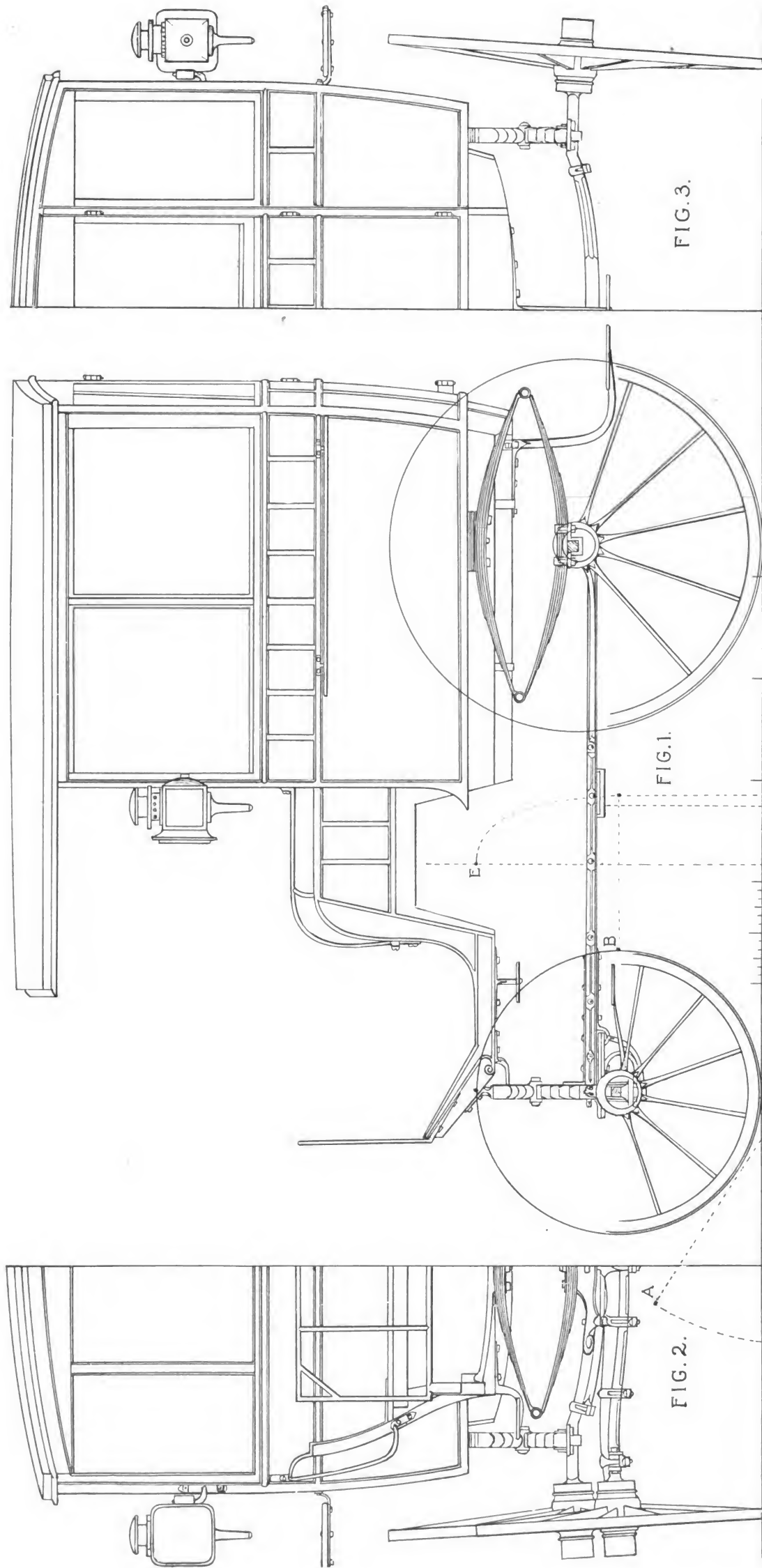


FIG. 3.

FIG. 1.

FIG. 2.

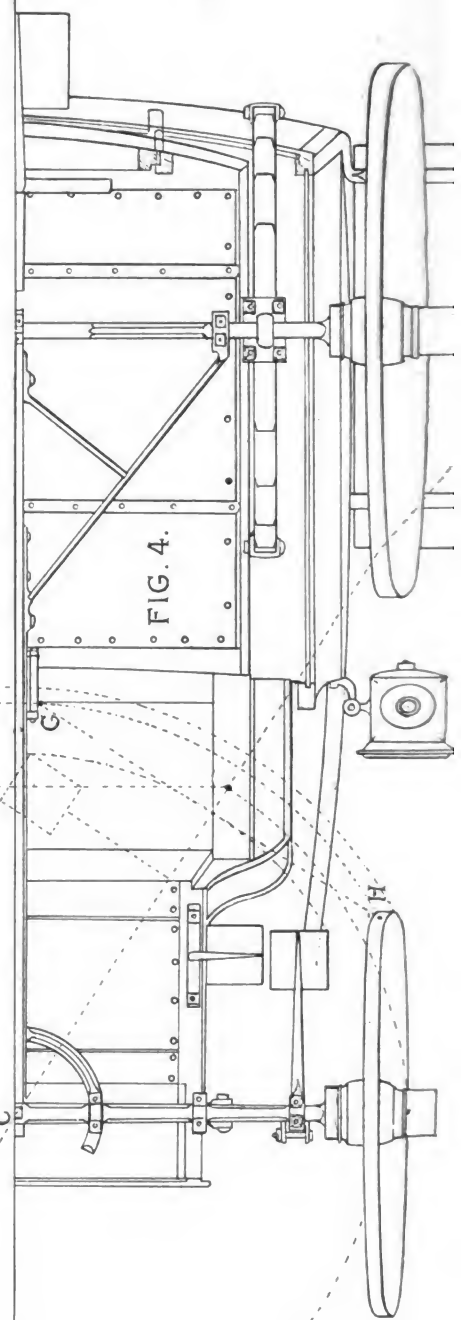


FIG. 4.

WORKING DRAWING OF WAGONETTE.

SCALE, $\frac{3}{4}$ INCH TO THE FOOT.

Wood Department.

WORKING DRAFT OF WAGONETTE.

Scale $\frac{3}{4}$ inch to the foot.

ONE of the most important features in the suspension of a carriage, especially of a wagonette, is the location of the wheels in the side or lateral positions. They carry all the weight and meet and overcome all road obstructions. Their positions determine the poise in a measure, and affect the appearance of the finished vehicle. We begin, therefore, by considering the position and the height of the front wheels, because their height determines practically the height of every part of the body, its height from the floor, the head room, position of the front seat, all of which are dependent conditionally upon the height, track, and passage of the front wheel. Therefore we design the arch of the wheel house according to the height of the wheel and the sweep when locked for a turn. When the tire of the wheel is against the chafe iron of the perch we must provide the necessary room for the movement of the wheel horizontally, and for the vertical action of the weighted body. The method of finding this trace is worked out in the plan, Fig. 4. The side shows the result upon the vertical elevation of the locked wheel.

We consider, secondly, the effect of the position of the front wheel upon the entrance to the front seat. To make it convenient it must not cross this passageway, otherwise it would be useless to provide steps if they were interfered with by the tire of front wheel. We therefore station the wheel sufficiently forward to obtain a comfortable passage to and from the seat. We consider as a third suggestion the lateral space, clearly indicated in the front elevation, Fig. 2, and in the horizontal plan, Fig. 4. The width between the tire and outside of the rocker is 15 in., and ascending to the front seat, from the near side.

We will next consider the position of the hind wheel on the axle, and its intersection with the floor, which are the primary conditions. Its vertical position is considered relative to the form of the body and the weight which it must carry. If stationed farther ahead it must support increased weight; if set farther back, more weight will be thrown upon the front wheel, and since we know that the hind wheels must carry the greatest weight, we select the most favorable position to meet the imposed conditions, but we have recourse to mechanical devices by providing and distributing the weight. We place the spring in close relation to the hubs of wheel, in such a manner that neither the hind wheel nor axle is excessively overburdened. In the front the center of the axle carries the weight, hence the burden for this single point is coequal with that imposed upon the arm of either hind axle. The back end of body being the heaviest, the wheel must be proportioned accordingly, the axle enlarged, the springs of sufficient weight to bear their share of the burden. We proceed to a second consideration of the mechanical disposition of the hind wheel of the wagonette, of which the ascending of hills is the most important, and that of a brake, applied to the hind wheels when desired. In this latter case the wheel is in the proper position to make room on the body for the brake; sometimes the brake is ordered, often not. In going up hill the weight leans toward the back, and on the hind wheel and axle; the hind wheel, as shown on the side elevation, is in the best position to receive this excess of weight.

In making the drawings for a wagonette the form can be traced to that of the bus and rockaway. It assimilates the front of a rockaway and the back of an omnibus, but the hanging off differs from either. The wagonette is of sufficient importance, owing to the steady demand, to be considered an independent and standard style of our country, being built nowhere else with the low seat. The length of body is 7 ft. 6 in.; height, 7 ft. 4 in. from the floor to top of the roof. The width of body is 54 in.; the height, 59 in. The body will not appear high for the length of the side, which is 45 in. The front seat is of the same dimensions as the interior seats, namely, 45 in. outside across the top of stanhope pillar. The length of the gear from the center of the axles exceeds the width or track by a trifle; the first is 64 in.; the track is 60 in.

By the front view, Fig. 2, we illustrate the axle, head-block,

spring, bracket, dash, seat, lamp, and finally the molded body, and the proportion is very well worked out for a guide in building up a full size model. If we add the hind we get the wheel, spring and axle, as seen from the front. The body is about 5 in. shorter than that of a straight front brougham, which carries only two persons inside, owing to the position of the doors and seat, but it is the same length as a four passenger rockaway. The door is hinged on the right side of standing pillar, as shown in the back view, Fig. 3; width, 23 in. The moldings are nailed on, save that of the belt, which is worked on; all other moldings belonging to the framework, which receive the edges and ends of panels, are worked and grooved. The crest panel is divided into eight parts by seven slats, which are $\frac{3}{4}$ by 3-16 in.; these are glued on. The moldings, except these, are fluted, as shown on the draft; the stanhope pillars have a convex-concave turnunder from 45 in. at top to 30 in. at bottom, which for each side will be $7\frac{1}{2}$ in., making the seat bottom 37 in.; 30 in. is wide enough for the dash or the bracket, provided we bolt on the steps as shown, which, as before stated, is for the purpose of conveniently reaching the front seat. We give to the front seat a proportional size, and obtain this width by a curve of the stanhope pillars from the rocker to the top of the seat panels, a distance of 21 in. The offsets thus obtained look well. The front seat has a cushion measure of 37 by 18 in., and a height of 10 in. Mold the sides the same as the crest panel. The glasses in door and those on each side drop level with the fence; the other four, two at each end, are fixed. The side spaces for glass frames are each 20 by 21 in.; the fixed end lights are 12 by 21 in.

The wheels are 34 and 44 in.; hubs, 7 in. long, $5\frac{1}{2}$ and $5\frac{3}{4}$ in. in diameter; point bands, 4 by $2\frac{1}{4}$ in.; axles, back, $1\frac{3}{8}$ in.; front, $1\frac{1}{4}$ in.; spread in the center to $1\frac{3}{4}$ in., called fan-tail. The springs are, front, 36 in. long, 10 in. high, $1\frac{3}{4}$ in. wide, 5 plates, Nos. 2, 2, 3, 3, and 4 steel; back spring, 37 in. long, 11 in. high, $1\frac{3}{4}$ in. wide, 5 plates, Nos. 2, 2, 3, 3, and 4 steel. Fifth wheel, 14 in. in diameter. Spokes, $1\frac{1}{2}$ in. by $\frac{1}{8}$ in., 12 and 14 to the wheel. Rims, $1\frac{1}{2}$ in. deep, by $1\frac{3}{8}$ in. wide, beveled to $1\frac{1}{4}$ in. tire. Rocker plates, $3\frac{3}{4}$ by $\frac{3}{8}$ in. An edge plate is placed across the body at the tail bar, $1\frac{3}{4}$ in. wide by $\frac{1}{2}$ in. thick, having the ends turned on to the side rockers, so as to prevent the lateral spring of the body.

To find the locked position of the front wheel and axle on the plan has always been an important point in the construction of a carriage, and unless this is first determined and then carefully worked out on each and every draft the body and the gear will not fit, and the work will be a failure. The wheel must have a clear passage when the carriage is fully weighted. The arch of the body must not collide with the tire of the locked front wheel, even if the springs come together. If from the side we drop the point B, Fig. 1, to the plan at G, its projection, and from C as the center describe this point to the perch at H and connect these two points by the straight line from G to H, we will have the position of the tire of the locked wheel in its horizontal plan. Then if at the height E, of the swing of the wheel, we describe this till it cuts the straight line A A, and thence vertically to the side elevation, we will have the information required in laying down the trace of the tire of the wheel, the position of the axle and that of the step, which travels in its turn with the axle. We can see the sense of this, since the height of this step is determined by the perch and its locked position in plan. The drawing shows that the carriage will turn on a ground space of 17 ft. 8 in., as the distance from A to A is 8 ft. 10 in. Hence the line A A is at right angles to the line G H. The point A intersects the prolonged trace of the front axle with that of the back axle, and no matter how far apart the axles may be coupled the principle will be the same. The larger the diameter of the front wheel, the more ground will be required in which to turn the carriage and the higher we must hang the body. The longer we couple the gear the more ground will be required on which to turn the carriage.

In hanging up a wagonette body the back end should be hung one inch higher than the level, as it will ordinarily settle that amount, and again, the poise of the body will be improved. Although built especially for only six riders, as occasion offers, more might crowd in, and if the hanging up is properly done this contingency will have been provided for. This, of itself, is an important reason for setting the hind wheel well back. Some carriage makers are prone to set it ahead to obtain a compact appearance, which is the first step toward spoiling its riding qualities.

POETS utter great and wise things which they do not themselves understand.—*Plato*.

Smith Department.

SLEIGH SHOES.

SINCE sleigh building became an industry, after the average pleasure sleigh got to about its third winter the marks of departure from a straight line, of the shoe and runner, began to become very evident a little in front of the center post and very much back of it, of which our outline, Fig. 1, is an illustration; A, front section of the shoe and runner; B, back section; C, front post; D, center post; E, back post. While this thing has been going on for years

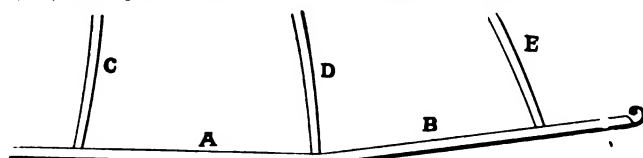


FIG. 1.

there has been no immediate cure yet presented. The back stays have been made stronger, the inside of the runner from the back post to the scroll has been plated, but all to no purpose. When the third winter got here the sleigh began to form a rocker, a result due to certain combined causes, which but few efforts have been made to correct, with the exception of those quoted above. The late C. P. Kimball, of Portland, Me., thought to overcome it with his grooved or channel shoes and steel back stays, but with partial success. When the third winter got here the crook was also here,



FIG. 2.

although not so marked as before. When solid or full length cast iron shoes were used the line was kept nearly straight for two seasons, or until this shoe became so thin that it would break, and then up would go both ends. Once the hind end reared its heels they stayed there, but the writer believes that a T iron shoe, in the use of which the flat portion does the wearing work, the web being let into the wood, will accomplish the work. The shoe being of high grade steel, properly secured to the runner, and all else in connection with it being done as illustrated and described, the runner will continue its horizontal shape as long as the shoe retains the proper thickness.

Fig. 2 shows the shoe as received by the smith. A, one side of the upper section of the shoe proper, on which is the web B, which

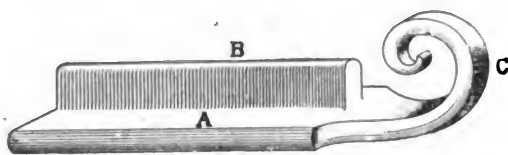


FIG. 3.

gives the iron or steel so made the commercial name of T iron because of its appearance, which resembles the letter T. C, the end, which shows both sides of the support in front, of the shoe and the web also.

Fig. 3 shows the hind section of the shoe, where a part of the web B has been removed to permit shaping that end of the shoe so as to form the scroll C, A being the same as A in Fig. 1.

Fig. 4 shows the front section of the shoe, showing where the web has been removed to permit of fitting to the nose of the runner, the

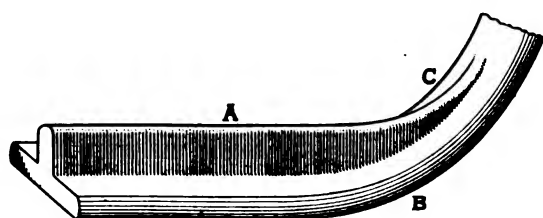


FIG. 4.

web stopping or ending at C; A, the web; B, the same as A, Figs. 1 and 2.

Fig. 5 shows a section of the wood runner and the shoe combined; D, the flat or upper side of the runner, made expressly that way for the purposes hereinafter described. E is one of the rounded por-

tions of the runner; F, the rounded edge of the shoe, projecting beyond the runner so as to preserve the latter from injury. C shows a cross section of the shoe and runner combined; A, lower flat part

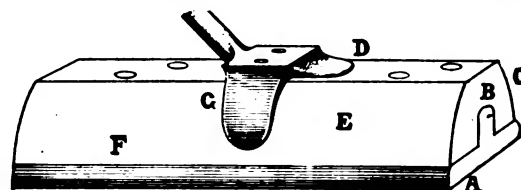


FIG. 5.

of the shoe; B, the web. Fig. 6 shows a section of the wood runner in outline; A, bottom of runner; B, recess for web in upper part of shoe; C, rounded side of runner, same as E in Fig. 5; D, upper flat section of runner, as per D, Fig. 5.

We now return to Fig. 4 and finish the description of that part. The part D is left flat to form a proper resting place for the heads and nuts of the screws, and the nuts securing the shoes, stays, posts,

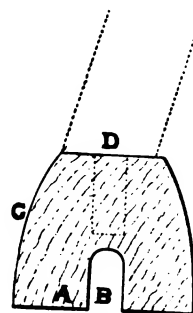


FIG. 6.

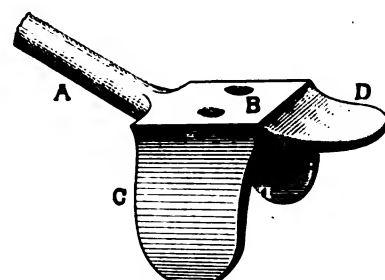


FIG. 7.

etc., to the runners. G shows the clip part of the side stays running from this juncture of the beams and posts to the runner, the clip portions of the same having for their object the prevention of the splitting of the runner.

Fig. 7 shows a section of the stay, clip back end and bearing

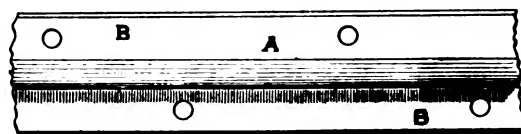


FIG. 8.

surface for the screws which secure the stay to the runner and shoe; A, section of stay; B, the bearing for the screws; C, one side of the clip part; D, end of the bearing or heel of the stay. The holes shown correspond with those on each side of the web B, Figs. 1 and 5.

Fig. 8 shows a section of the shoe, and location of the holes in the shoe part, B, on each side of the web A.

Fig. 9 shows one of the posts A, the inner portion of the bottom section, and the tenon; C, the shoulder of the post, which rests on the flat part of the runner D, Fig. 5; D, an edge of the post; E, the

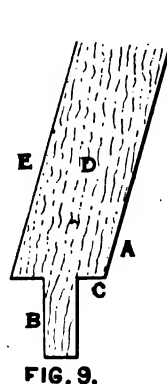


FIG. 9.

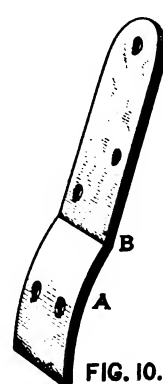


FIG. 10.

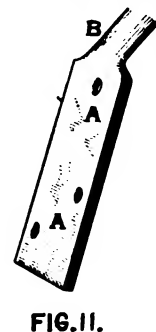


FIG. 11.



FIG. 12.

outer surface. The tenon is so formed that when the post is in the right position it is clear of the web B, Fig. 5.

Fig. 10 shows a joint plate which applies to the post and runner: A, the part which fits the rounded part of the runner E, Fig. 5; B, the angle or corner of the juncture between the rounded posts of the runner. The holes are for securing the plate to the runner by means of bolts which pass from the inner side of the flange or web.

Fig. 11 shows the lower section of the post and beam stay which secures the inner side of the post; the holes in it are identical with

the holes B, Fig. 8, and are for the purpose of the insertion of bolts securing the stay to the post in connection with the plate, Fig. 8, to the upper section B, to which are welded the connections of the plate part of the stay and the stay proper. Secure the runners to the shoes, and all the side stays to the shoe and runner by means of square head machine screws, tapped into the shoe on each side of the web. Make the screws as per Fig. 12; A, the head, and B the threaded screw part. Make all but the stay screws 3-16 in. diameter. Make the stay screws 7-32 in. diameter, all twenty-four threads to the inch. Where the screw heads do not rest on iron, place a washer under the same to prevent cutting into the wood part of the runner. In all other respects the ironing is the same as with other sleighs.

IRONING SLEIGHS.

THROUGH common usage the sleigh builder has made the use of iron braces to the knees on the sides to appear to be a necessity, and few wood knee and beam sleighs are ironed otherwise, and yet it is difficult to find a light sleigh that has been used during one sleighing season that does not show knees out of position and runners more or less bent, or "hogged," faults that the iron braces are supposed to prevent, but which too often they aggravate, by creating an additional rigid point of contact. The weak point in the framework of a sleigh is where the knees are mortised into the runners; here there is no more wood than is necessary to hold the framework together while constructing the wood portion, and to provide a foundation for the ironwork. The use of T irons in connection with the brace that supports the knee on the inside on heavy runners gives sufficient strength, but on light runners, where more is required, they do not insure the required protection, as they fail to stiffen the weakest point in the runner, which is at the mortise. If the lower edge of the T was turned to form an angle under the runner, and let in flush with the tread, it would get a good bearing on the shoe, and greatly increase the strength of the runner at the joint. Corner irons, one arm resting on the runner and the other against the knee, will, however, prove far more satisfactory than the T irons or braces. The only objection that can be raised against them is the bulky appearance they give to the runners at that point.

Faulty location of the front knee is often the cause of trouble. If set too high on the bend the runner will flatten immediately behind the knee; if too far back, the front will flatten. The best results are obtained when the foot of the knee is mortised in the runner so as to have the bends about two inches above the level at the center of the tenon. Owing to the draft being high up from the ground the pull is upon the upper part of the framework of the runners, and the tendency is to draw the top of the frame ahead, and careful bracing is needed to overcome the trouble.

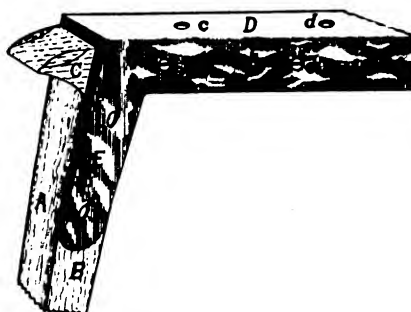
If braces are used on light sleighs they should be straight, otherwise they are of little value, and the heels, instead of being turned in one direction, should have a T bearing and be bolted through both arms of the T if on the top of the runner, or the T head can be flattened to a half round and riveted to the inside of the runner. In this case the head may be lengthened, and thereby give a long bearing along the inside of the runner, thus strengthening the latter without materially increasing the weight. The tendency of the rear end of the runner to bend upwards is due to two causes; either the rear knee is set too far forward, or the extension of the runner is too great. In Portland and other sleighs of that character the foot of the knee should be back of a perpendicular line drawn from the top of the back rail of the body, and the T head to the inside brace be made to extend to the back end of the runner. Care must be taken to locate the draft eyes for the shafts or poles at a point where when in the position they occupy when in use the draft will insure a level runner; if too high, the sleigh will run low forward, and if too low the run will be upon the rear end of the runner. The use of "bob" runners on four or six passenger sleighs insures an even tread, and does away with the unsightly kinks in long runners.

The tendency with most blacksmiths is to load down the light woodwork with iron, which not only adds to the weight of the sleigh, but decreases the resisting power of the wood by making it rigid, and a blow of any kind that is sufficiently heavy to bend the iron produces a set instead of a bend that will spring back when the cause is removed. The wood and iron should be so near alike in their rigidity that they support each other, but if any difference exists let it be in the wood, for if the latter is the stiffest it will support the iron, and by preventing a set bend will hold the material

in shape and wear much longer than if either the wood or iron becomes set through any cause. Light spring steel shoes are preferable to those of iron, and if given a spring temper they will not only wear well, but will retain their shape.

POST AND BEAM PLATE FOR SLEIGH.

As a general thing makers of the sleighs that enter into general use aim to produce them at the lowest possible cost of labor and material. The fact that the beams and posts are the main stays, which enhance the strength of those parts, and at the same time decrease the cost of production, will prove of value. To aid towards this end we present a new departure, which does away with the inside stay and the post and beam corner iron. B shows a section of the back



POST AND BEAM PLATE.

part; A, section of outside of post; C, scroll end of beam; D and F are angle irons, which are on two sides, top and back sides of the beam. E is a lug welded onto the angle iron and run down on the back side of the post. Hole *a* is for the small bolt, hole *b* for back stay bolt, holes *d* and *c* to secure body to beam. Hole *e* is for screws to secure the same to the beam and to prevent springing. This method will be found cheap and durable for ordinary sleighs where the post is not too long. The part E may be run down the post to the wood runner and turned to an angle, taking one shoe bolt in the runner.

CALIFORNIA REDWOOD.

THE growing scarcity of whitewood admonishes the carriage trade of the necessity for procuring some substitute for panel timber, and it might be well that California redwood be given a trial. It is highly recommended as a finishing timber, is free from season checks, sufficiently close grained, and is stronger than whitewood. The building trades are finding it desirable; why not the carriage? The *Lumber Trade Journal* says of it:

"Judging from recent reports there seems to be some anxiety among the dealers and builders throughout the East as to whether the supply of finishing lumber is going to be curtailed to an appreciable extent on account of the disastrous fire at Ottawa. It might be well to note in this connection that there is no cause for alarm, as California redwood is very plentiful, reasonable in price, fine in color and finish, and, as a matter of fact, is finely adapted for finishing lumber. Redwood is cheaper than white pine was before the Ottawa fire, and it has been demonstrated by those who have used it that it is equal to any other lumber for building purposes. Redwood is fast taking the place of many of the expensive hardwoods for interior finish and decorating purposes. It is without an equal for finish which is to be carved, as it works easy and does not chip off or crumble under the tool."

VEHICLE FOR INVALID SOLDIERS.

ZENAS THOMPSON & BRO., carriage manufacturers, Portland, Me., have completed a handsome vehicle destined to go to the Soldiers' Home at Togus. It is adapted for the purposes of a 'bus or ambulance, as may be desired, and is to be a gift from two old soldiers. The vehicle bears the following inscription: "Presented to the Medical Department of the Eastern Branch, National Home, D. V. S., by Zedekiah Thompson and Clarence S. Gregg for the benefit of their invalid comrades."

Paint Department.

COLORS FOR SLEIGHS FOR THE WINTER OF 1900 AND 1901.

As has long been the custom, *THE HUB* for June of each year devotes special attention to sleighs, both in the Fashion Plates and technical departments. It may be thought early to take up the matter of painting, but we are disposed to believe that we can best subserve the interests of those of our readers who are engaged in the manufacture of sleighs by confining matters pertaining to sleighs to one number of *THE HUB*.

The sleigh, more than any other pleasure vehicle, depends upon the painter for its adornment, as the bodies in most cases are plain, and there is very little to the running part, and unless painted artistically there will be a general sameness in appearance, instead of a pleasing variety. Fashion has changed, too, and the styles of bodies are almost as numerous as those of wheeled vehicles. With these changes the opportunities for the painter have increased. Then, too, there is a marked difference in the demands for different sections, and it becomes an absolute necessity that the views of the different buyers be respected. East of the Ohio State line the city and large town trade demand fine coloring and very little ornamental work, while much of the country trade want additional ornamenting. The city demand throughout the Middle West is much the same as it is in the East, but the country trade demands strong colors and much ornamental work, while the West and Northwest base merit on the amount of ornaments that can be distributed over the surfaces. These classifications serve to guide the painter when preparing his work for the special markets. Sleigh builders who make medium and high grade sleighs pay close attention to coloring, while makers of cheap sleighs confine themselves to a few colors, those that will cover the wood at the least money outlay having the preference, and because of that heavy blues, greens, browns and black are most used. These have also learned that they get far better results from transfer ornaments than they possibly can from the work of the ordinary painter, and as a result there is very little hand work in the way of ornamenting done in the shops. This fact explains the seemingly incongruous appearance of the work, where the plain painting is all rough and the workmanship careless, while the ornaments are extremely neat, artistic and attractive.

The dominating colors last winter were green, red, white tinted red, green or yellow, for light sleighs, and green, brown, black and red for the heavy. Some of the favorite colorings for the light road sleigh, Portland pattern, were coach vermilion body, dark coach red on wood of running part, black ironwork, striping black and fine lined nickel. Pea green body, pale willow green runners, black ironwork, striping gold. Pink white body, primrose runners, carmine striping. Other combinations were green bodies and white runners, carmine bodies and cream runners.

The heavier lines of single sleighs were in darker colors or shades. London smoke, striped black, and coaching red runners. Brewster green bodies, carmine runners; olive green bodies, vermilion runners; dark green body and light green runners. The striping, as a rule, was in narrow lines; that on the panels followed the outline. The ironwork was mainly black, not striped.

Four passenger sleighs were in dark colors, such as deep green. London smoke, bronze green, carmine, or black, with runners of the same color as the body, or one of the many popular reds. The striping lines, where a single stripe was used, were wide, say $\frac{1}{4}$ to $\frac{3}{8}$ in.; where two lines were used $\frac{1}{4}$ in. was the maximum for the wide line, the second line being a hair line of some contrasting color. Victorias and other sleighs of that character were generally painted black throughout and striped red, or black bodies and red runners. Monograms, or initial letters, were freely used, but never on the center of the panel; where possible, the letters were placed near the top of the panel, at the junction of the arm-rail and front pillar. Others were placed upon the upper rear corner of the panel. When corner scrolls were used the letters were omitted, or placed upon the front pillar near the top end. In case of square bodies or the break class the letters were placed upon the front seat risers. The letters, when put on by expert letterers, were fine line; transfer letters were more ornamental.

In mentioning the colors that were used last year we have made reference only to those that proved the most popular, and as has been the case heretofore, these colors will be the leaders this fall, while new combinations will be put on trial. Among the novelties of last year were bodies with green side panels, and carmine, or other red, back and front panels. Other colors were used in a like manner. One light road sleigh had red side panels, pink-white back panels on the body and front of runners, the runners themselves being white on the outside and red underneath. The ironwork was black. The appearance, however, was more novel than artistic. A break sleigh with body modeled after the road break, attracted much comment. It had the body panels painted a deep emerald green, slats and trimmings pale willow green, striping a brilliant red. The runners and knees, which were of wood, were painted willow green on the faces and edges, the backs being red and the ironwork solid black. For a sleigh of its class this fancy combination of colors was not out of place.

The colors and combinations mentioned above comprise those used on the better grade of sleighs, where the painter had an opportunity to do good work and where the price warranted the use of the most delicate shades, and where two or three coats more or less would not be allowed to interfere. These, however, constitute a small portion of the total number of the sleighs built. The greater portion of two passenger sleighs sell at a price that precludes the possibility of devoting much time, or of the use of any but the best covering paints, but there need be no inharmonious combinations, nor unsuitable colors.

The two colors that should not be employed are blue and strong yellow, both of which are cold and unsuited to winter vehicles. The reds, greens, and those other colors that are tinted with these, are numerous, while black, which is so easily brightened up with red, white, etc., is cheap and durable. The browns cover well, and give good results when a dark shade is used on the panels and a lighter shade on the runners. Dark greens also cover well, and a dark green body with some strong red on the runners gives a good combination and covers well.

As we have said, transfer ornaments provide decorations far superior in color and design to those that can be put on by the ordinary painter, and are very much cheaper. We therefore recommend their use, unless the hand work is done by an artist. Scrolls, set pieces, monograms and initial letters of desirable sizes can be had, but the painter should be careful not to overdo the matter by too free use of transfer or other ornaments.

THE EFFECT OF HEAT ON VARNISH.

A CRITICISM BY A CARRIAGE FINISHER.

UNDER head of "Paint Department," page 15, April *HUB*, an article favoring a high artificial temperature for the drying of varnish was ably presented.

The article contained many worthy and practical ideas, but some of the contentions put forth were, from the writer's point of view, erroneous, and not capable of successful demonstration in the everyday affairs of the finishing room.

For example, the argument sets forth that varnish "could be used in a temperature of 100° with much better results than in a temperature of 70°, as is generally the case. A temperature of 100°, without there is steam in connection, is always a dry temperature, while a temperature of 70° is often moist."

Working many of the carriage varnishes to-day in a temperature of 100°, as intimated by the writer of the article in question, is a feat much easier to cope with in theory than in practice. A 100° temperature would cause—in fact, does cause—some of the finest carriage varnishes obtainable to work so short and quick as to prevent the best form of flowing and laying off. This has been the writer's experience upon more than one occasion.

Again, the statement that "a temperature of 100°, without steam connection, is always a dry temperature," cannot be accepted unreservedly, as an infallible rule. We have worked in body finishing rooms, the temperature of which on a hot, humid July or August day has been more than 100°, with an air reeking with moisture. During the summer months, as the sweltering inmates of the big factory varnish rooms are fully aware, a high temperature, running to 100° degrees or more, is never an accurate indication of an absolutely dry temperature.

The article under discussion further advises: "There is no reason why carriage makers should not varnish their work in as high a temperature as it will stand. If too hot for men to work, to varnish in a room with the temperature as high as they can stand, and put in another room with a temperature as high as the work will stand, to dry."

Here, again, theory becomes a much more glittering and gay deceiver than practice, because practice proclaims differently. The experienced finisher insists upon drying his varnish in the same temperature (or as near to that as can be maintained) that was had while the liquid was being applied. He knows that danger lurks in the wake of a reverse practice. Apply finishing varnish in a room temperature of 70°, then set away in a temperature of 100° to dry, and the chances are as 5 to 1, to be conservative, that the varnish goes sufficiently fluid to ruffle into an extended array of draperies and fantastic welts. In a certain railway coach finishing room recently a coach surface was varnished at a temperature of about 75°. Subsequently the temperature was raised from 10° to 15°, with the result that the varnish—a high class article—thinned out and went into a wide expanse of runs and sags. Until the secret of perfectly controlling varnish under widely varying conditions is more fully unfolded than now, the theory of applying varnish in a temperature of a certain degree and setting it away to dry in a much higher temperature must remain incapable of practical working out.

In advocating a very high artificial temperature, 150° say, in which to dry varnish, as the writer of the article referred to does, is there not danger of going to a more dangerous extreme than would be the case if a temperature of 90° were advocated? It is a fact established in both theory and practice that when varnish reaches a certain degree of dryness it becomes perfectly hard, in fact its elasticity has departed and it begins to deteriorate and gradually to perish. Is it not possible, then, under a high artificial heat—a heat to which, during its active service, it is not exposed—to dry the elasticity, the life-giving element, so completely out of varnish as to render it barren of the necessary service resisting power? When the oily nature of varnish, by virtue of age, intense heat, etc., has been hardened beyond the point of elasticity, then the varnish, like dead men's bones, has lost its protective and beautifying properties, and it becomes inert and useless.

Is not this a practical conclusion, conceded by varnish makers and varnish users alike? And, if so, is not the practice of subjecting a freshly applied varnish to a high artificial—or natural—heat a mistaken and dangerous practice? Is there not decided risk in drying varnish as rapidly as a temperature of 150°, or more, would enforce?

"A frequently washed surface goes dead quicker than one that is not" is another assertion offered by the writer alluded to, to which a passing word may be devoted. This, it seems to us, depends upon the way the washing is performed. Clean water, carefully and frequently applied with clean, soft sponges, the surface then nicely dried off with a chamois skin, also clean, prepares a varnish to retain its luster and afford reasonable durability far in advance of the surface uninterruptedly concealed under the corrosive and blighting accumulations of smoke, dirt, dust, mud and other acrid agencies of service. A surface in use is constantly gathering, through the medium of its power of attraction, substances which, if left undisturbed for any considerable length of time, poison and sap the vitality of the varnish.

Frequent washing is necessary to remove and carry off these accumulations, and if clean water is more destructive to the gloss of varnish than the harsh, biting effect of the agencies above named, then a protracted paint shop experience must be written down as subject to more startling discoveries than "the man with the hoe" has laid bare.

A LARGE OAK LOG.

In a log pile in a Cincinnati lumber yard, among a lot of white oak Indiana logs, there is one oak log in particular that possibly breaks the record. As a matter of curiosity, it may be stated that it measures 56 inches in diameter, a size so big that no allowance is made in the ordinary log books. It will probably scale about 1,700 feet. It is good and sound clean through. The owner proposes to cut herefrom quartered oak boards from the center that will measure 24 inches wide and show a perfect figure. A giant sycamore log in the same yard is also worthy of note. It is 50 inches in diameter and scales 1,587 feet.

Trimming Department.

SLEIGH TRIMMINGS.

THE materials used for sleigh trimming consist of cloths such as are used by the carriage trade, and plushes and velours. The cloths embrace such as are used for medium and lower grades of carriages, except for the few high grade sleighs made for the custom trade by leading builders. Bedford and whipcords are used to a limited extent upon fancy sleighs, but there is no reason why the low priced whipcords cannot be used more extensively than they are. They have a fresh, neat appearance, wear well, and can be had in a variety of colors, or in neutral shades, making them specially valuable for sleigh work, and while wearing better and appearing more stylish than cloths, they cost less. We think the builders of sleighs who take this matter in hand will find that their sleighs will sell better than if plain cloths are used.

There was a time when plushes were the lowest priced material used for sleighs, but that is not the case at the present time, as lines of cloth are to be had which are much cheaper than the plushes. The lowest priced plushes are mohair; these come in three grades, and in a variety of colors, and can be made to order to match any color or shade. The next grade above is the printed velours; these come in four grades, but the colors and shades are few. These printed velours are used on a fine grade of sleighs, and are quite popular in some localities, notwithstanding the prices are comparatively high.

The finest grades of sleighs are trimmed with heavy carriage broadcloths, green being the favored color. Some cabriolet body sleighs are trimmed with drab or light cloth, and a few high grade trotting sleighs are finished with maroon cloths.

In making up, very little lace is used on the finer grades, but pasting and seaming lace are freely used on the lower grades. The patterns follow closely those for buggies of like grade. In trimming the low grades it is absolutely necessary to use cheap stuffing materials, but better grades have springs of some kind, or curled hair or moss.

Far more attention is paid to trimmings than heretofore, and a very large percentage of the lower priced sleighs are full trimmed with fixed or movable squabs. The latter are to be preferred, as they can be kept dry, and will therefore last much longer than they will if fixed. Sleigh riders have learned that springs, soft cushions and other conveniences go as far toward making sleigh riding pleasurable as do the same appliances with wheeled vehicles, and now that materials are cheap there is no excuse for the hard board seat and the rigid runners. The price depends upon the quality, but the variety of materials is such that the lowest as well as the highest priced sleigh can be made comfortable.

PHYSICIAN'S BROUGHAM.

THE accompanying illustrations show designs for trimming a physician's brougham. Those who are familiar with this class of work will readily observe in them a fitness of the designs for this special purpose, the materials to be used being goat skin and satin. Trim the back quarter, head lining, and the upper part of the front, with satin; the back, side quarters, cushions, front, and the doors, with goat skin. Fig. 1 represents the back quarter and the outside lines of the back. The tufted part of the back and side quarters must be made on frames covered with common muslin, with one ply of buckram. Shape the buckram to fit the squab part, and then paste it to the muslin. The satin for the tufted squabs is to have only ¼ in. fullness each way between the tufts. Fold the goods along the tuft lines on the wrong side and closely stitch near the edge of the fold. The glass for the back light is round, but the inside should be blocked to form a square cap or cover. Fit the satin around the glass plain, with wadding underneath.

Lay off the back in points and rolls, and make up in the usual manner for a back of this kind, except at the top part. Mark off the top line of tufts with a dotted line just above them, which indicates the lower edge of a muslin roll. After the rough lining has been marked off, and the goat skin made ready for the tufts, make a muslin roll at the top of the back, just above the line of tufts, and fill with wadding (not hair). Shape the wadding in this wise: Cut wadding the length of the roll and fold layer after layer until thick

FACE all things; even adversity is polite to a man's face.

enough, then sew the folds together with needle and thread without wax. Lay the hair on the rough lining layer upon layer, between the roll and the bottom, to the desired quantity; place the last layer over the roll. The object of the cotton roll is to do away with so much hair at the top of the back, which soon gets out of shape.

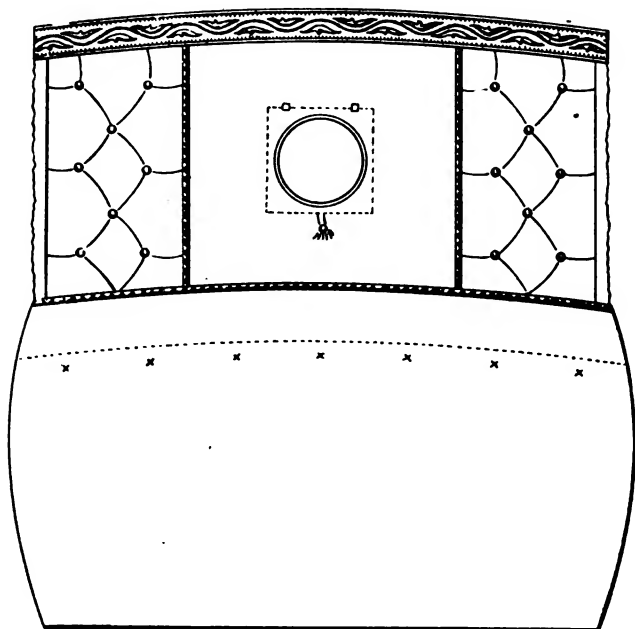


FIG. 1. BACK SQUABS.

causing the goat skin or cloth to become loose and out of form. The cotton roll makes a good, firm, and soft backing for the top. Fig. 2 represents the side quarter squab.

The goat skin for the squab above the arm-rest must have $\frac{5}{8}$ in. fullness each way between the tufts. Join the back and quarter squabs together at the back pillar, with goat skin roll between. Cut the goods for the roll $3\frac{1}{2}$ in. wide, with the top and bottom edges well rounded off, and sew in between the squabs and fill with wadding. Make the wood block for the arm-rest wide enough to screw to the job after the quarter and arm-rest are fastened to it. Bevel off the out edge of the block for the arm-rest.

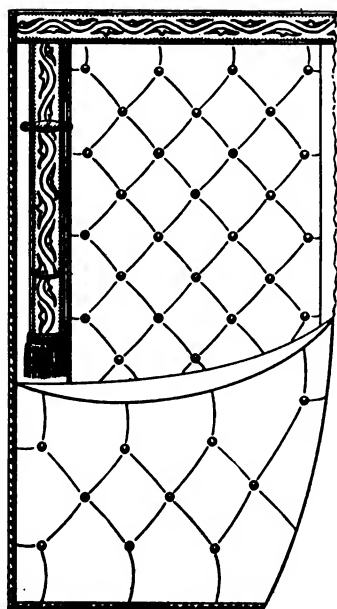


FIG. 2. BACK QUARTER.

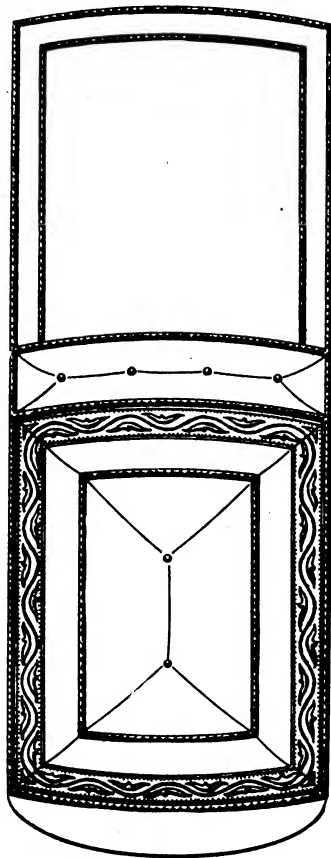


FIG. 3. SASH DOOR.

Lay off the goat skin for the quarter with $\frac{3}{4}$ in. fullness each way between the tufts. Work up the upper part of the quarter full, the bottom part below the tufts very thin. Shape the arm-rest piece of dash leather, with a piece of linen pasted to the flesh side. The arm-rest piece requires only a thin roll, with the out edge bound with seaming lace.

Make the cushions in the usual manner; finish the seat front with a small roll, instead of seat fall. Cover the floor with rug carpet.

The sash door is illustrated by Fig. 3. The entire door is to be trimmed with goat skin and lace. Make the rough lining with canvas and buckram, well pasted together. Make the rough lining at the top space separate, and $4\frac{1}{2}$ in. wide. Cut the goat skin $5\frac{1}{2}$ in. wide, no fullness lengthwise. Mark for the tuft lines on the flesh side and stitch near the edge of the fold. Trim the points at the ends by plaiting at the tuft line. Make the center part of the squab with one piece of leather, without fullness between the two tufts or tuft lines, except around the edges. Mark for the tuft lines on the flesh side. The leather must be folded and rubbed down along the lines, and stitched near the edge of the fold. Tuft the leather and draw over a thick layer of wadding; baste the edges down and trim off along the center of the width of pasting lace. The adjoin-

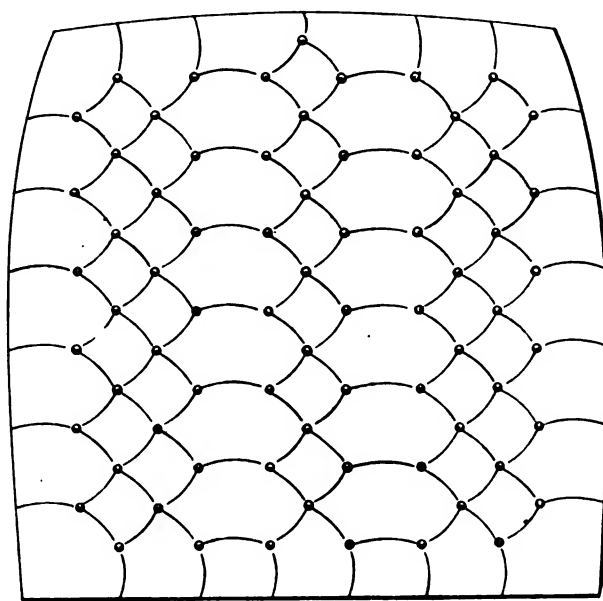


FIG. 4. ROOF SQUAB.

ing space, which is $2\frac{1}{2}$ in. wide, is to be filled with pieces of thick landau leather cut $1\frac{1}{8}$ in. wide, with both edges neatly skived off on the grain side. Paste these pieces on to the rough lining near the edge of the $\frac{5}{8}$ in. space made for the pasting lace, and paste a thin layer of wadding on the leather strips and trim off neatly to the edges. The goat skin, which consists of four pieces, must be mitered at each corner, so as to give a smooth, oval surface when finished. Miter the broad lace in the same manner, but instead of leather oval strips use a roll of wadding under the lace. Rub the raw edge of the pasting lace firmly down, and paste the lace on to the space made for it. Edge the outer edge of the broad lace with goat skin, and stitch the selvage edge of the lace. Baste the inner edge of the broad lace to the rough lining with needle and thread, without wax; stitch the pasting lace on each edge. Stitch the broad lace on close to the selvage edge. Finish the space between the two parts of the rough lining with pasting lace. Finish the top of the door with seaming and pasting lace. Finish the outer edges of the door with pasting lace only.

Fig. 4 represents a tufted squab for the roof lining, laid off in blocks 5 by 5, or $4\frac{1}{2}$ by 5 in., the center row in diamond form, the row on each side of the center in blocks or squabs, the other rows in diamond form. The tufts should not come too close to the edges, or that part of the squab will appear crowded and bungled. Before laying off the rough lining study the illustration closely; observe the spacing off and the end tufts. Lay off the satin with 5-16 in. fullness between the tufts each way; rub the satin down along the tuft lines on the wrong side, and stitch close and evenly near the folded edge.

Fig. 5 represents the design for the front. Lay off the two tufted squabs in diamonds, 5 by 6 in.; give $\frac{5}{8}$ in. fullness to the goat skin between the tufts each way. Finish the other parts as directed for the two back quarter tufted squabs.

The space in front between the tufted squabs is occupied by a large covered case, a convenient holder for cards and other printed matter which goes with a doctor's outing. Cover the case with goat skin, and fasten it in place with cap screws at each end. Just below the card case an opening is represented; this has a lid with lock and key, a handle, and two hinges at the bottom of the lid. The

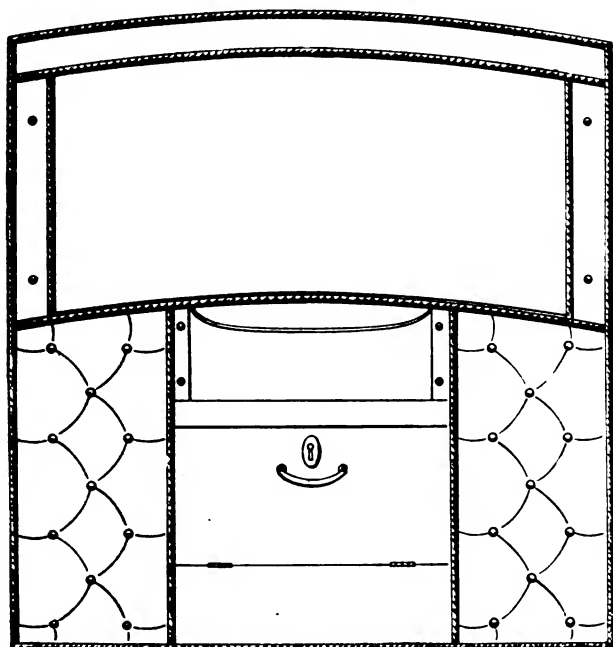


FIG. 5. FRONT SQUABS AND FITTINGS.

inside of the enclosure is a good sized closet, nicely lined with some kind of soft woolen goods, in which the doctor will find ample room for all of his surgical tools, bottles, books, etc. Cover the portable pieces on the side of the front with goat skin, and fasten them to the pillars with cap screws. Cover the top part of the front with satin.

CARRIAGE MAKERS' CLUB.

THE regular monthly meeting of the Carriage Makers' Club, of Cincinnati, O., was held at the Grand Hotel Thursday, May 17, with a large attendance, all anxious to hear the report that would be made by the committee appointed at the April meeting to arrange for the annual June 9 outing, an event of no small moment among the carriage trade.

The application for membership of B. W. Williamson, representing the Sligo Iron Store Co., of St. Louis, was received, and having had the favorable endorsement of the executive committee, he was unanimously elected to membership.

A change in the constitution, as proposed at the April meeting, was voted upon, and members are now required to pay their dues in advance.

The proposed fall festival was discussed by the members present, and it was enthusiastically endorsed, and a committee of five appointed to co-operate with committees from other organizations to push for its success.

Quite an entertaining program was prepared by the regular entertainment committee, Price Henderson reciting a number of selections which were enthusiastically received by the members, as were also the piano, violin and vocal selections.

Mr. H. L. Gordon, member of the board of equalization, gave a very entertaining address on "Expansion," treating it from a business standpoint, and reviewing the past history of this country in the success attending previous territorial expansions.

The following members were in attendance:

L. A. Harker, L. G. Mayer, G. H. DeGolyer, A. G. Brunsman, O. E. Walker, E. F. Alf, H. Z. Callender, Julius Lang, Jr., George W. Brown, W. J. Kauffman, H. Ratterman, H. H. Nelson, Lee Mitchell, O. A. Timberlake, C. F. Albrecht, W. H. Vanduzen, E. S. Bogle, Joseph Snow, O. D. Bryant, George Monteith, James Sheet, C. C. Wick, W. F. Bruenger, Jacob Haberer, Jr., E. D. Albrow, H. R. Leebman, James Wallenstein, C. L. Barnett, Ed. H. Bowman, E. V. Overman, M. C. Center, M. A. Doucette, Theodore Scheu, W. L. Hawes, Louis Buob, Jr., C. Bauer, J. Taylor, O. Armleder, William Bryan,

John W. Herron, Jr., H. H. Elwood, W. W. Sechler, Max Jewitt, Theodore Luth, C. L. Stephen, W. H. Baur, J. P. Pollock, W. J. Haldeman, E. R. Shaw, H. L. Gordon, M. J. Crotty, H. M. Pollock, H. Higgins, S. D. Baldwin.

CARRIAGES IN SINGAPORE.

In a previous article THE HUB called attention to the growing demand for carriages and carriage parts in Indo-China, and the opening for American manufacturers of these goods in eastern markets. In the main, the conditions prevailing in Saigon are duplicated in a number of other countries located in that part of Asia. Many cities that have been undergoing the influence of European civilization at the hands of the French and English during recent years are now beginning to show the result of European development and labor by a growing demand for home comforts and luxuries.

Conspicuous among these cities is Singapore, the capital city of the British possession known as the Straits Settlements. Out of a small native population the Europeans who settled there many years ago have built the present large city of Singapore, with a water frontage of more than four miles, a population of more than 100,000, and numerous well-developed industries. They have instilled European ideas into the minds of the populace, and practically created a European colony, similar to that of the French Cochinchina.

One of the large lines of business that has sprung up with the development of Straits Settlements is the carriage trade. Although British carriage manufacturers early established themselves in the colony, and by employing cheap Chinese labor were able to gain control of the trade in cheap vehicles, the great bulk of the carriage and wagon market has been supplied by foreign countries. An idea of the extent to which foreign nations participate in Singapore's carriage trade may be gathered from the fact that the annual importation now amounts to over \$160,000, and is rapidly on the increase. Of this importation Japan may be credited with \$95,000, England with \$50,000, and the balance to Germany and Belgium. What few imports come from the United States are classified under England, and cannot be given with exactness. The total amount, however, does not exceed \$5,000.

As will be seen from the above figures, by far the largest share of the import trade is in the hands of the Japanese. Notwithstanding the strenuous efforts put forth by the local manufacturers to oust them, the Japanese have energetically established themselves in the market, with the result that their trade with Singapore is increasing with greater rapidity than that of any other nation. Germany and Belgium send mostly carriage parts, while England exports dog-carts and other light open vehicles.

Among the classes that drive for pleasure the dog-cart may be said to enjoy the highest favor. Those on the market and in use are fitted with strong, high wheels and provided with top and foot-board. Both horses and ponies are driven to them. The open dog-carts are double seated, for four persons, to sit back to back. A great many carriages are also imported in the white, and finished in the local factories by skillful workmen brought from China and Japan. The bulk of the axles and springs used are made in Birmingham.

Although, as stated, the demand for cheap vehicles is adequately supplied by the local makers and Japanese importers, Singapore offers a respectable market for another class of goods that has thus far not been sufficiently cultivated, namely for high grade, smart turnouts, such as are manufactured in this country. The population of Singapore numbers scores of wealthy merchants, high government officials and titled natives, who maintain fine residences and extensive stables. "Style" among the wealthy is, in short, as inexorable in Singapore as in any European community, and it is among these classes that a large amount of lucrative trade should be secured by those of our manufacturers who are willing to make substantial endeavors to establish themselves in the market. It is a well known fact that in the production of high-grade carriages the English, Japanese and Germans are far behind the United States. Hence there is no reason why eastern money should not find its way to American pockets as readily as to England or Japan.

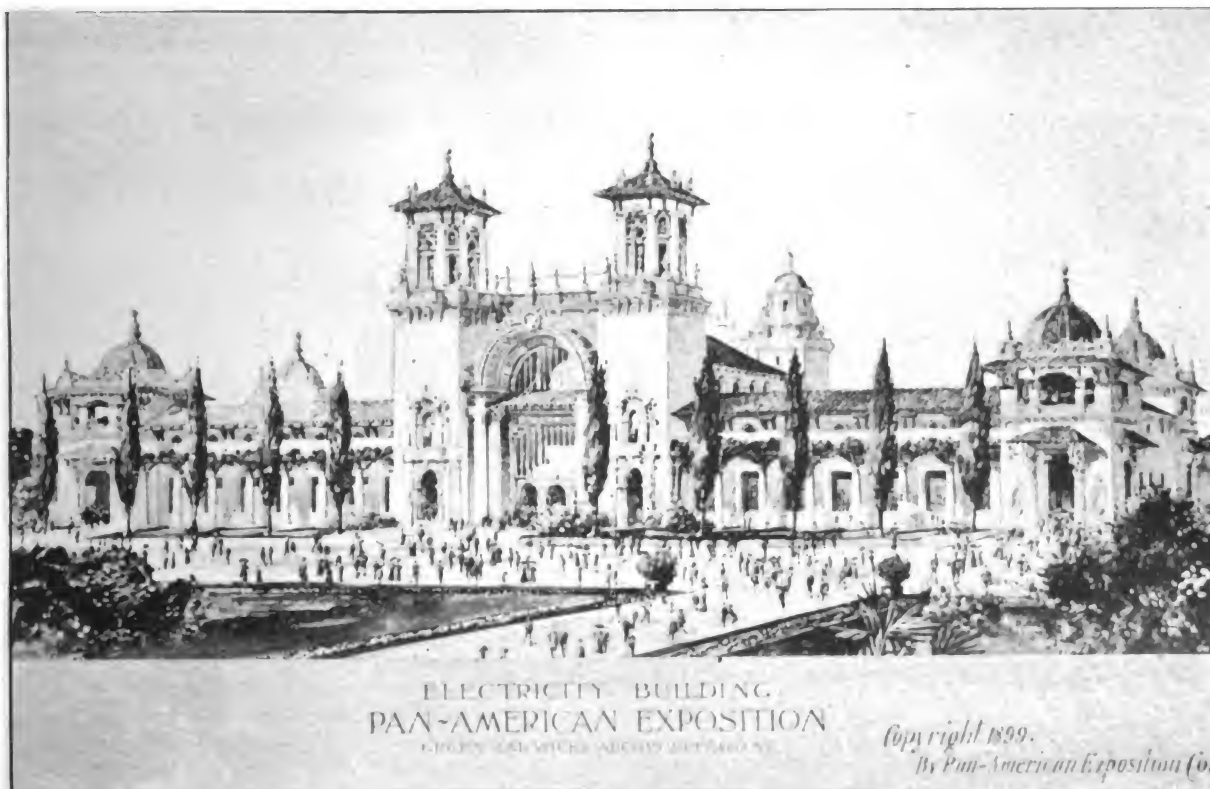
Singapore being a free port, there are no customs duties whatever to obstruct exports from this country. Altogether there are some twenty or thirty import houses in Singapore, some of whom could no doubt be induced to accept American agencies and work them satisfactorily.

PAN-AMERICAN EXPOSITION.

ELECTRICITY BUILDING.

ELABORATE designs have recently been completed for the Electricity Building for the Pan-American Exposition, to be held in Buffalo, N. Y., May 1 to November 1, 1901. Displays of all kinds in the practical and artistic uses of electricity, together with complete exhibits of electrical machinery and appliances, are to be conspicuous features of the great Exposition.

The designs contemplate a very handsome and commodious building. The structure is to be 500 feet from east to west, and 150 feet wide, giving an exhibition space of 75,000 square feet.



The south façade fronts the Mall and the north fronts the Midway. The east end is toward the massive Electric Tower, while the west faces the Grand Canal. The building is long, low and inviting. The design of the façades shows artistic grouping. The openings of the pergola-like loggias, placed at frequent intervals, present a delightful effect, showing more and more of the details of the pilasters and openings as the eye travels to the end of the building farthest away from the observer.

There is a pleasing ending at each corner of the structure, with a low domed pavilion tower, and the building is interrupted at the center by a double towered entrance. This entrance, wide and high, is spanned by an ornamental arch and supported on each side by columns. The towers, also, have minor entrances through them.

The connecting work between the towers, the towers themselves, the pavilions at the corners of the building, and similar places, are to be brilliantly illuminated and made gay with banners and flags.

The modeled relief work of the building is of the choicest design. The general ornamentation of the structure is to be frescoes in an interesting mixture of reds, greens and yellows. The general color scheme follows that of the Machinery and Transportation Building and other groups of buildings of the Exposition. The structure was designed by Green & Wicks, of Buffalo.

Every department of electrical science will be covered, either in the form of exhibits or in elaborate public displays as conspicuous features of the Exposition. The building to be devoted to electricity is west of the great Electrical Tower, and on the north side of the Mall, opposite the Machinery and Transportation Building. The visitor who comes expecting to see the greatest electrical wonders of this electrical age will in no wise be disappointed.

TIME is money, and many people pay their debts with it.

CUBAN DUTIES.

UNDER the tariff of 1900, carriages and other vehicles, imported partly finished, paid the duties corresponding to their class under the tariff of 1898, with a rebate of 40 per cent. under certain conditions. Most finished carriages were charged 40 per cent. ad valorem. The new tariff puts them uniformly at 25 per cent. ad valorem, including railway carriages of all kinds for passengers. There is also a provision that certain articles, when imported direct by a steam or street railway company or planter of the island of Cuba, for the exclusive use of said railway or planter, within twelve months of the promulgation of the tariff, shall be admitted at 10 per cent. ad valorem. The articles under this head are: Passenger

coaches, freight cars, trucks, wheels, axles and fixtures for passenger coaches and freight cars, pine wood prepared especially for freight cars, locomotives and tenders, locomotive boilers and furnaces, plates and tubes and other parts, electric motors and machinery for power-houses, turntables, transfer bridges, iron or steel bridge work, steel rails, points, crossings, signals and metal ties.

The free list is similar to that of the tariff of 1898, but contains several additional articles. Samples, works of art, personal effects, standard text-books, plows, hoes and agricultural instruments, hemp, flax and ramie and quinine are among the articles continued on the free list or added to it by the policy of the War Department. If serious defects appear in the tariff as published, the War Department will entertain suggestions for amendment between the present time and the taking effect of the new rates, which is on and after June 15, 1900.

HORSE SHOWS FOR 1900.

ATLANTIC CITY, N. J., Henry W. Leeds, secretary, July 11, 12, 13 and 14.

Long Branch, N. J., Monmouth County, P. J. Casey, secretary, August.

Newport, R. I., Henry F. Eldridge, secretary, 1 West Thirty-eighth street, New York City, September 3, 4 and 5.

New York State, Syracuse, N. Y., September 17 to 22.

New York National Horse Show Association, J. G. Heckscher, secretary, 16 East Twenty-third street, November 12 to 17.

GENERALLY, a downright fact may be told in a plain way, and we want downright facts at present more than anything else.

FIRST SPEEDWAY PARADE.

SIX MILES OF ROADSTERS REVIEWED SATURDAY, MAY 5, 1900.

THE Road Drivers' Association of New York City can be accredited with having given the lovers of the horse a rare treat in their first speedway parade, which occurred on Saturday, May 5, and in which fully 800 horses participated. Never before was there such a gathering of speedy horses in light harness and before light wagons. The projectors of the movement had anticipated a goodly number, and when they issued their official catalogue the numbers ran almost up to 600, but on the day of the parade fully 200 more were in line. When we take into consideration the fact that this parade was for roadsters, and that more than 350 had records of less than three minutes, while there were hundreds without records that none but those having the lowest would care to contest, we can form some idea of the feeling in this city regarding the light roadster. Those who feared that the day of the American trotting horse

Those who give preference to the mechanical motor will have ample opportunities to indulge in speeding the automobile, without clashing in the least with the horseman's favorite. Both sports may be enjoyed, and as the foolish antagonism is removed the possibilities of rational sport will be increased.

It is seldom that a parade brings out such an army of sightseers. As it was, the sidewalks and points for observation along the entire line of parade, from Seventy-second street to the north end of the speedway, a distance of about seven miles, were thronged with spectators, the parade itself being nearly six miles long. It is true that all of the horses in the parade were not owned by New Yorkers, but the fact that Philadelphia, Buffalo, Hartford and other cities each contributed speedy roadsters shows how far-reaching the feeling is in favor of the trotter, and emphasizes the statement that the roadster never before stood so high in the estimation of gentlemen drivers, and that there are scores of cities where speedways could be built, to the advantage of the horse raiser and trainer, the carriage builder, the harness maker and the gentleman driver.



VIEW ON SPEEDWAY. HEAD OF LINE.

had passed must have rejoiced at the sight of so many hundreds of fleet, beautiful animals, while the builder of light carriages could go to his home after the parade satisfied that the light carriage, the typical American vehicle, that has no counterpart elsewhere, would retain its place, and the demand for it would increase for years to come, no matter how great the call for the motor vehicle.

The revival of this great sport in New York is due to the building of the speedway, as a road set aside where gentlemen can speed their horses without interference from heavy vehicles of any kind, whether motor or horse drawn, and where the ever-in-the-way bicycle cannot enter. The demands of the times call for street cars, and in every city the residence avenues and streets, as well as those devoted to business, are given over to railway companies, and pleasure driving on them is no longer possible. The park drives and a few boulevards offer opportunities for heavy pleasure vehicles, where horses are driven at moderate gaits, but where speeding is impossible. This condition of things did much to discourage fast driving, but lovers of the roadsters in New York succeeded in getting a speedway built for their use, and immediately the demand was revived for fast roadsters, light vehicles, and harness. How great this demand has become can be judged from the success of the first road drivers' parade.

The original plan contemplated the forming of the parade at the north end of Central Park, but as the entries increased this was abandoned, and it was decided to start at Seventy-second street and Riverside Drive, the different divisions to form in the side streets. For an hour before the start there moved on the upper West Side streets a panorama of fleet horses, one man road wagons, standard style, bike wagons of the new school, side bar buggies, carrying two persons, and other light vehicles, running on their solid rubber or pneumatic tires as noiselessly as the summer wind. The air was cool and bracing, and the spirited animals seemed to enjoy the sport as well as the drivers and sightseers. Owing to the American disposition to be in the lead there was some confusion as to position at the start, but long before entering the speedway all were in line, and jogging along at a slow trot, showing the beautiful forms of the horses and the perfection of the light road rig. He would be a stoic indeed who could not see beauty at every step of the six mile procession, or would wish that so marked a feature of American out-of-door life be done away with, nor will it be, so long as man's admiration of man's best friend continues.

Dr. H. H. Kane, the president, and the other officers, as well as the members of the Road Drivers' Association, are to be congratulated on the success of the first annual parade. It will be useless to attempt to enumerate the horses, but we can say without fear of contradiction that never before was there such a collection of equine beauties, such an array of light, graceful vehicles and thread-like harness, or such crowds of interested spectators to view and applaud the American gentleman's most delightful and exhilarating pastime. Thanks to the projectors of the speedway, and to the men who as an association gave the opportunity to show to the world that the horse and light carriage hold a place from which they cannot be driven by mechanical appliances, no matter how perfect or beautiful the automobile may become, and that there is room for all, and THE HUB hopes to be able to report more speedways, more horse shows, more automobiles, as all tend to make life more and more beautiful, and to contribute to the health, wealth and prosperity of our people.

COLUMBUS, O.

THE Columbus Buggy Co. has just gotten out a "spiderette" which will be placed upon the market in a short time. While in general make-up it is much like the spiders gotten out by some other factories, it is very different in some respects. The body is made up in graceful curves, and stands much higher than is usual in this kind of a vehicle. This, of course, throws the seat up, and the bed curves up to it both from front and rear in an easy manner. It is painted black, with gold mountings. The hangers are of the goose-neck pattern, but with a more pronounced curve than is usual. Taken all in all, this will be one of the handsomest wagons they have put out for some time. This company has a fine export trade, which is growing daily. The goods go to Europe, the West Indies, South America and the Hawaiian Islands. The war in South Africa spoiled a good business for them there. All the goods exported are the same as made for the trade here, with the exception of those which go to the Hawaiian Islands. The people there require heavier vehicles than are used here, and most of the jobs sent there are of the two-seated carriage pattern.

The Peters & Herron Dash Co. are putting out a good line of goods for the manufacturing trade. Mr. Peters said they had made some changes in the general outline of dashes from those used last

year, but that they were not radical. A small dash for buggies is now made with an angle of about 45°, extending from the second rod of the frame to the top. In curved dashes there has been little change. The company has made designs for automobile dashes, and will no doubt add these to their line.

The John W. Brown Manufacturing Co. has put out two new lamps this season, which are meeting with good success. Their acetylene gas lamp is something new to the carriage trade in this part of the country, but it is meeting with a hearty reception. The principles of the bicycle lamp are carried out, but instead of having a lamp with a large and awkward looking bowl below, they have succeeded in preserving the general outlines of the carriage lamp. The receptacle for the carbide is below the lamp, and the water is just above this, with the pressure so arranged that the blaze is always steady. The bowl is small, and looks just like the ordinary carriage lamp. The electric lamp uses the usual globe burners, and the current is stored in batteries which are placed under the seat of the vehicle, connected with the lamp by flexible wires. In

can be done. In the mean time the orders will be taken care of in some of the other factories in which Mr. Lanman is interested.

The Columbus Transfer Co. has established an automobile hack line, and the first machine is now in operation. It is a four passenger electric brougham, of the Woods make. It is the intention of the company to put six of these machines in service, but it has not been decided whether they will all be of this pattern or not. So far it has proved quite successful and has been well patronized.

Oscar S. Lear, bicycle dealer, is now handling the Woods electric vehicle and the Elgin gasoline machines in this city.

A suit has been filed in the United States Court here to test the validity, or rather constitutionality, of the vehicle tax law enacted by the last Legislature. M. J. Daniels brought the suit through his attorney, M. B. Earnhart. It is claimed that this will operate as a double tax, since vehicles are also taxed as property, and that it is against the provisions of the constitution to select any class of property and place a tax on it for special purposes. No objection could be brought against a bill that would have made a general tax



VIEW ON SPEEDWAY.

some of the lamps the batteries are carried in the bowl, but this method has not proven so satisfactory as the other, and will do only in small lamps. The company makes a general line of oil lamps also, for carriages and hearses, as well as a line of carriage mountings.

The Anderson Carriage Co. has gotten out a vehicle this season that is quite a novelty. It is a gypsy wagon, executed in handsome designs and finished in the best style. The wheels and gear are made on the usual pattern, and of course, are strong and durable. The body is paneled, and finished in plain colors mostly. The cover is something like that of an express wagon, or perhaps that of the latest delivery wagons. On the sides rural scenes are painted, the execution being invariably good. Under the ends of the seat in front appear various designs, the one in particular which the writer saw being two swans. The corners and edges of the body were made of beadwork. It is supplied with everything needed, and has the usual luggage carrier in the rear. The company has put out a number of them, ranging in price from \$250 to \$700. They build a general line of fine carriages, and heavy trucks and delivery wagons also.

At the present time the Scioto Buggy Co. is doing little export business, but the manager stated a few days ago that they possibly would look after foreign trade somewhat this fall. At the present time they could do nothing with it, as the home trade is crowding the factory.

The fees claimed by E. B. Kurtz, receiver for the United States Carriage Co., have not yet been allowed by the court. He put in a claim for \$15,000 for two years' services as receiver and \$5,000 for his attorneys. The attorneys were allowed \$4,000 by the court, but before Judge Badger allows the receivers' fees he proposes to take the testimony of a number of business men as to whether they are fair or excessive.

The bolt shops operated by H. A. Lanman in the State Prison were destroyed by fire some weeks ago, entailing a loss, estimated by the proprietors, of \$100,000. A large amount of new machinery was ruined, as well as much of the old machinery that had not been replaced. There was also a quantity of finished work and material in the building, all of which will be almost a complete loss. The insurance is about \$54,000. The board of penitentiary managers have decided to erect new buildings in the place of the ones destroyed, and the shops will be in operation as soon as this

for the purpose of improving the streets. There have been other measures which have stood the test, and it is the belief of those interested in the matter that this one will stand the test also.

The Admiral Bicycle Lamp Co. will within a short time put out a new acetylene automobile lamp, which has some advantages over others in its general make-up. The water is admitted from an outer chamber which encircles the carbide chamber, through a tube, in such a way that it regulates the pressure and produces a strong, steady blaze. There is such a small quantity of the carbide saturated at a time that the light can be extinguished almost as quickly as any other lamp. It is not bunglesome, and will make a valuable addition to the list of carriage and automobile lamps.

The Colonial Carriage Co., of Circleville, O., has been incorporated with a capital stock of \$20,000, divided into shares of \$100 each. The charter will allow the company to manufacture and deal in buggies, carriages, wagons and automobiles. The incorporators are: J. P. Smith, William Schleyer, Herbert C. Martell, G. C. Boyer, Benton T. Hedges and Charles A. Smith.

Eilert Bros., of Ironton, O., are erecting an addition to their hub and spoke factory. They have received a lot of new machinery, which is being installed in the new building. This firm is doing a good business, and was compelled to add to their facilities.

The Monarch Vehicle Co., of Columbus, O., has decided to secure new quarters for their factory, the move being made necessary by the increase in their business during the last few years. The plans have not yet been determined upon, but they will need a large and commodious building, in which all modern machinery for a complete new plant will be installed. This company is preparing to do some export business, owing to demands made upon them for goods from other countries.

The Columbus Chain Co., Columbus, O., recently incorporated, will erect a factory in the southern portion of the city. The new plant will manufacture chains of all kinds and for all purposes.

The Blizzard Vehicle Apron Co. has been incorporated at Columbus, O., with a capital stock of \$10,000. The incorporators are: James C. Nesbitt, John Gourley, Walter J. Shapter, Theodore F. Gault and Hugh Nesbitt. The company will manufacture vehicle aprons, horse covers, wagon covers, tents and awnings, lap dusters and other things of this kind. The factory will be located in Columbus.

Dealers' Department.

THE MUTUAL RELATIONS BETWEEN MANUFACTURER AND DEALER.

Two friends were quarreling. There seemed to be no way to settle the differences. Each insisted on his independent rights. They separated. A friend of both secured from each a statement of his grievance and showed how he might reconcile his friend and act in harmony with him. The result was a re-approachment, a renewal of friendship, and a new and better understanding established. This is what has happened between dealers and manufacturers, and the trade journal has been the peacemaker. It has stated the complaint of each side, and suggested the remedial plan for renewed co-operation between these two necessary factors in the carriage business.

It has been said by some that this was a private matter concerning the dealers alone. Others have said it was one concerning carriage manufacturers alone, and that either were competent to handle their own affairs. But time demonstrated that neither were in position to handle the matter at issue without a mediator.

In acting in this capacity it was evident that the dealers of the country must formulate their position in such clear shape that it could be handled. To this end organization was a necessity. The same was true of the manufacturers, who possessed several local clubs and a national association. But it was not until recently that the dealers, urged by the trade journals, and assisted thereto by every facility in their power, effected organization in such a manner as made it possible for the manufacturers to arrange with them a basis of mutual co-operation and a restoration of the former terms of pleasant intercourse and profit making. In speaking thus it is not necessary at this time to re-state the points of difference which prevailed and which still exist, though in a modified form. It was unavoidable that some few on either side of the controversy should resent the interference of a third party. But the bulk of the trade, both manufacturers and dealers, have readily apprehended the great benefits which the trade journals have brought to general conditions by their course. What seemed chaotic destruction has been averted. Order once more has sway, and safety in business is more firmly established.

The work is not yet completed. Much remains. The welding of all the dealers' associations under a central and governing congress, with an executive head, an established means of communication, and concerted action with the Carriage Builders' National Association, is a consummation yet to be desired. In this direction the latter organization has, in a spirit of great friendliness, taken the first step, but without substantial response from the dealers. It is therefore the province of the trade journal to urge the importance and benefits of these overtures, and their acceptance in the spirit of comity. If carriage manufacturers have been guilty of actions injurious to trade interests in the past, they now ask for light on what is expected of them for mutual consultation, with a promise to do what is right and best for all concerned.

It is through the columns of *THE HUB* chiefly that the whole plan of reconciliation and mutual action has been discussed, broached and formulated, and because of which whatever action has resulted was set in motion.

In the meantime the common sense of the trade, under the awakening, is doing much between individuals to conserve those friendly and confidential relations which should always prevail. The cause of complaint naturally becomes minimized under the growing prosperity of the country. Nevertheless, the plan of organization should go on until perfected on a broad and durable basis, so that whenever any question of general importance comes up the necessary machinery will be at hand for its effectual handling.

The matter of protection is, however, not yet placed in any sort of control which will insure permanent and general effectiveness, neither is any other matter of concern to the various organizations. All the measures which have so far been enacted by the dealers' associations are of local character, and depend upon individual members for their force. Self-interest sometimes annuls even this. We are in hopes that something may be done that will be lasting in its results, and prove an ever growing power for the good of the trade. We are convinced that all the branches of the carriage business may find permanent benefit in getting together in a harmonious effort

at improvement. Let each one give his best thought to all, and each one then receives a thousandfold more than he gives. There is nothing more profitable to be devised. When each member of a local organization strives for the good of all, and is aided by the united efforts of all other similar associations, a tremendous uplift must result.

The carriage dealer needs it. The carriage manufacturers need it. To say that any one of these can settle their own affairs is as much as to say a man can lift himself by his own suspenders. The trade has tried it and found it futile. The voice of protest from no one member availed. But when the trade press spoke it was listened to, for through it the entire trade spoke. He who would belittle the trade press in its efforts belittles himself. The trade press is the trade censor, the trade conscience, and represents that which is highest and best in the minds of the trade. Through it have come all those larger blessings and possibilities which are the glory of the carriage trade to-day, among which are friendly feelings, interchange of ideas, and a desire to be of mutual helpfulness.

The carriage maker has experienced the benefits of organization longer than has the dealer. He did not form his association in any spirit of antagonism, but to quench that spirit.

When the dealer will throw away his pugnacity, and greet the carriage maker as his best friend, and stand by him faithfully, then the trade will stand on a firm foundation. But there is a difference between carriage makers. We admit it. Some are not worthy of the name. Some pose as wholesale manufacturers, but are not. Some pose as protectionists, but are not. The purpose of any real organization such as we have advocated, and which we think is now had in view by both dealers and manufacturers, is to sift the wheat from the chaff, and so decide who are worthy of the sworn hand of friendly co-operation.

The plan of surveillance instituted by dealers is good so far as it goes, but it does not go far enough, nor will it until the carriage makers institute a similar work on their side and carry it on with all earnestness. It can only be done by employing the same means the dealers use, viz., an executive force, and an exchange of information with the executive officers of each association. As a peace maker, a bringer together of all parties to that point where the final treaties can be made, the press has done its part. We think no one can truthfully say it was not a needed labor, nor that it was not done well. But if the finishing touch is not put to the work, if the arches of the fabric are not properly capped to form the grand dome of the house of concord, it shall not be for want of an architect nor a plan, nor for precise directions, but because the individual laborers have refused at the last moment to complete their own work in covering their own heads.

We dislike sermonizing, but it had to be said, and we sincerely hope that the saying of it was unnecessary. It is, after all, a matter of pure business, of commercial importance, of dollars and cents. It is a question of whether the dealers and manufacturers shall get a profit on their sales or not.

Some may not comprehend the matter from any high moral standpoint, but they can do so very clearly from the commercial point of view. The prosperity of the trade is ours also. We share in it. *THE HUB*, together with all other trade papers, is a part of the business life, and shares in the general results, just as other members of the trade do. We have a little wider point of view, and are able, as the watchman on the tower, to signal of coming events, or announce a proclamation. The best minds in the trade are enabled through us to speak and be heard. But we have commercial interests at stake which are bound up with those of the carriage trade at large. Hence we are not altogether unselfish in our advocacy of measures which will benefit us because they benefit all. But we commend this sort of selfishness to every member of the trade. If there is no higher motive, that in itself should be sufficient to induce the co-operation of everyone.

We have given ourselves heartily to the work. The dealers of the country have responded, slowly at first, but gradually as they realized the business side of the proposition they fell into line, and then put on what force they could to bring the carriage maker to see things as they did. This was effected and is still maintained under threats of withdrawal of trade unless the carriage maker conformed to the dealers' rules. Only through the influence of the press has the conscience of the manufacturer been aroused, so that now he is ashamed of his past course, is anxious to disown it, and is looking around for some one to blame it on. "All's well that ends well," and this is no time for recrimination. There is much to do. A grand unification of the trade is yet to be accomplished. A national organization is yet to be effected.

It was perhaps with some such thought that the motion was made at the last C. B. N. A. Convention to admit dealers as members. But that will appear to be on reflection entirely inadequate. It will be necessary to give the dealers official recognition as a body. That was no doubt the further thought when the committee was appointed to visit the dealers' associations and invite deputations to a conference, but the dealers have plainly stated what they want, and it yet remains for the manufacturers in a body to say what they will do in response to those expressed wishes. Are there any certain number of carriage manufacturers who will agree to stand by the principles of protection. That is the enunciation the dealers are waiting to hear authoritatively from the manufacturers. Then there will be peace and confidence.

WHAT THE DEALERS SAY.

Now that the three spring months have passed, we may form some idea of the trade conditions by what the dealers say, and what they say gives us encouragement for the future. Crop conditions always influence trade more or less, but owing to the greatly improved situation in the West and Northwest they are less a barometer than in years past, and yet the growing crops exert no little influence, and therefore dealers differ somewhat in their reports. Taken as a whole, however, the wagon trade—that is, the farm wagon—has been fairly satisfactory, although not as good as it was last year. This is attributed to the advance in prices, made necessary through the advance in the cost of materials, and dealers in some localities have been compelled to sell without obtaining the full advance made by manufacturers. In those localities where the crop prospects were encouraging less trouble was experienced in obtaining prices, but even here the agricultural community were slow to accept the necessity of an advance in vehicles and implements. Under the most favorable circumstances prices of grain were not likely to advance, and a close comparison of reports appears to show a falling off of sales of from 5 to 10 per cent. from what they were during the spring months of 1899. This, however, was not unexpected, and that the decrease in sales was not greater is a gratifying surprise to both dealers and manufacturers. The latter were slow to make an advance on the prices of wagons, fearing the effect upon sales, and the falling off in sales has been less than the majority anticipated. The feeling, therefore, is favorable, and the outlook indicates an overlapping of sales into the summer months to an extent that may bring the totals of 1900 close to those of 1899, when they were the largest ever known in the history of the farm wagon trade of the country.

There has been very little friction between the manufacturer and the dealer. The latter has recognized the necessity of an advance on the part of the manufacturer, and has been willing to bear a share of the burden thus necessarily imposed, rather than to cut down the volume of trade by an arbitrary adherence to the new rates.

Dealers have been cautious in their purchases, and equally so in their credits, and they start into the summer trade in a satisfactory condition.

The "buggy trade," as it is best known, started a little late in the West, and was even slower in the Northwest, so that it was fully a month late. In the central belt, however, the conditions were better, as they were also in most portions of the South. Throughout the East the general carriage trade was extra brisk for the month of April, but May sales were less satisfactory, although there was a steady demand for light road vehicles. May, on the contrary, proved to be a good month in the West and South, and dealers generally report satisfactory sales and excellent prospects. Dealers complain somewhat of the activity of the catalogue houses, but those who have looked carefully into the matter are disposed to accept the situation, and meet the competition in a business way, instead of attempting to correct the evil by protests or combinations. They concede the right of the catalogue houses to do their business in their own way, and they know what temptation *cash* is to the manufacturer. So, instead of losing valuable hours in striving for some way for checking catalogue sales, they devote that time to devising means whereby they can increase their own. The fact that catalogue houses sell for cash only shows that there is a large cash clientage waiting for an opportunity, and the enterprising dealers do not intend that all the cash buyers shall go to the catalogue firms. With the pleasure vehicle trade, as well as with that of farm

wagons, there has been little trouble between the dealer and the manufacturer, and it is to be hoped that misunderstandings will be less as time advances. Trade is in a healthy condition, and as there is no probability of a disarrangement of prices during the balance of the season, we may safely predict a continued season of prosperity.

AMERICAN CARRIAGE EXPORTS.

CARRIAGES of American manufacture have been exported to some extent for many years, but never before so largely as at the present time. A branch of this trade that is of comparatively recent growth consists in the export of trotting vehicles. Buyers from European countries where the American trotter is popular who attend the big auction sales of trotting horses in this city, buy here also trotting equipment, sulkies and wagons and light harness, and American manufacturers have agencies for such things in Europe. Such equipment would be found in use in England, France, Germany, Austria, Russia, and wherever the American trotter goes.

Besides the trotting vehicles some other carriages of American make are sold in Europe. A few carriages made in this country might be seen in London. Russia has bought some American top buggies; for novelty's sake or because they are American, or simply because they like them; and some for lighter pleasure carriages have been sold elsewhere in Europe, these including carriages sold here to visitors from foreign countries. Thus a Frenchman visiting the United States walked into the New York City establishment of an American carriage manufacturer and looked along at the many vehicles exposed for sale. A handsome light driving wagon caught his eye and his fancy.

"Would that hold me up, if I should get into it?" he asked with smiling politeness, as he surveyed its light construction.

He was assured that not only would it do that, but that it would prove a strong and serviceable vehicle; and he bought the wagon, and a light American harness suitable to use with it, and they were boxed up and shipped to him in France.

This American maker had sold probably a dozen carriages in this way to as many individual buyers from European countries, visitors here, who had walked in, and looked over the stock, and found something that pleased them; but these sales were counted rather as items of the retail business of the concern, than as constituting a European export trade. In fact, apart from the export of trotting vehicles, which amounts to something considerable, the export of American vehicles to Europe is limited; to various other countries, however, it is large and steadily increasing.

Awhile ago an American manufacturer sent a little lot of light sleighs of American style to Norway, and sold them there, but this was more in the nature of a venture, just a little flyer.

American carriages of various kinds are sold in numbers in Mexico, the West Indies, South America, South Africa and Australia. The carriages sent to these various countries include some, though not a great many, of the heavier kinds of carriages, such as victorias, coupés, broughams and coaches; but they include many vehicles of the comparatively lighter kinds, such as buggies, runabouts, phaetons, surreys, two-wheeled carts and rockaways. There is found in the American carriages a combination of characteristics that are common to many American productions, namely, lightness, strength, sightliness and adaptability. They suit the requirements of use in countries to which they are sent better than do the heavier vehicles imported from Europe, and more and more of the people of those countries now buy carriages here; so that take it altogether the vehicles exported have come to constitute a very substantial item in the American carriage trade.—*New York Sun*.

OREGON HARDWOODS.

It is claimed that the forests of Oregon contain large quantities of oak, ash, maple and other hardwoods that can be used by carriage, wagon and implement builders, the quality of the timber being equal to that from the eastern forests, and far superior to that from the interior. A plant has been established at Corvallis, Ore., which is being fitted up with sawing and other machinery for cutting and working the timber into marketable condition.

OLD age increases us in wisdom—and in rheumatism.

Streets and Roads—Their Construction and Maintenance.

THE GREAT ROAD BUILDER.

IN every department of work, in each calling and pursuit, there arises, sooner or later, a leader who shows the way to the best methods, and makes an indelible impress upon his vocation. In road building, such a man was John Loudon MacAdam. True, good roads had been built before his time, but not so simply and cheaply. Good roads have since been built; but, on the whole, not more simply and cheaply. His system combined many of the best features; his theory was practical, practicable and successful, and his name has been given to the roads he built, and which are to-day, with slight modifications, those most commonly constructed. To know something of such a man and his methods is most valuable, and we follow Mr. Olcott's description in the following account.

MacAdam was born in Scotland, and, after spending part of his youth in the United States, returned home and turned his attention to road making, soon becoming famous in his own country, and afterwards all over the world. It is said that of the 30,000 miles of roads in Great Britain, five-sixths of them were reorganized during his life. He saw the opportunity of his time. British roads had been stuffed for years, by local authority, with all sorts of stone, dumped in roughly and often unbroken, till traveling with comfort was no longer possible at any season. He declined to be called an engineer. He was a road maker, developed in time of great need. Instead of three-fourths team work, as had been customary, he employed three-fourths labor. We can guess what a row that change would raise.

He revolutionized the whole business of road making, by showing everybody—even women and children, who could pick the rough stones out of the road, break them and lay the fine fragments back again nicely—how to make the best of wheeling, sometimes with half the old material. We, by the force of false prophets and so-called "civil engineers," with prize essays and much obsolete stereotyping in "patent insides and outsides," are actually copying the old road bottoms MacAdam left behind him. MacAdam's methods, or what were said to be his, spread like wildfire, however, and doubtless much was done not as he would have it—then as now. Hear him and weigh his words well. After insisting upon draining the road bed wherever it is necessary, he says:

"The broken stone is only to preserve the under road from moisture, and not at all to support the vehicles, the weight of which must really be borne by the native soil, which, while preserved *dry*, will carry any weight, and does, in fact, carry the stone road itself, as well as the vehicles upon it." Again, he says: "The stone is employed to form a secure, smooth, water-tight flooring, over which vehicles may pass with safety and expedition at all seasons of the year," and again: "Its thickness should be regulated only by the quantity of material necessary to form such a flooring, and not at all by any consideration as to its own independent power of bearing weight. The offices of the stone are to endure friction and shed water." Still again he says: "The erroneous idea that the evils of an underdrained, wet, clayey soil can be remedied by a large quantity of materials has caused a large part of the costly and unsuccessful expenditures in making broken stone roads." Evidently there were parties before MacAdam's time who found profit in supplying large quantities of stone to dump on the highway. Can we doubt, if he were among us to-day, that he would order up much of our work, to be broken over and relaid, solid and clean, on a dry foundation?

MacAdam was essentially a teacher. He set hundreds and thousands of needy laborers at work—entire families of cottagers right at their doors. No doubt he learned much of them. How could he be expected to teach an old laborer that hammered stone at ten pence per ton would furnish the sharpest kind of gravel, fit to rust and cling into rock when once every particle is well set and bedded in a road? British labor at that time was born to that knowledge, and the secret of MacAdam's popularity was that he understood it better than its recent masters, who were being taught, rather against their wills, how to make a road.

Every wayside in England was a school for the English middle and upper classes in those days, and there are signs in the literature of that period that many would-be leaders hated this man, MacAdam,

who presumed to come between misguided labor and themselves. They took honors and emoluments by prescription. He would not accept a baronetcy, and until old and impoverished by his patriotic exertions, he refused the £6,000 pounds voted him by parliament. Too well known to be hung for disputing the doctors, the heroic face and life of this great Scotchman are singular appearances in the world's road history.

REPORT OF COMMISSIONER OF PUBLIC ROADS.

We are in receipt of a copy of the report of Harry I. Budd, State Commissioner of Public Roads for the State of New Jersey, for the year 1899. This report is an extremely interesting review of the work of the commission for the year, showing the work done, its character and cost, and the benefits to the inhabitants of the State where the roads have been completed. The work is well illustrated with photo reproductions of roads and streets, before and after their improvement, which furnish excellent object lessons for all interested in roads and road making.

PENNSYLVANIA ROAD COMMISSION.

A COMMISSION has been appointed to look into the question of good roads for the State of Pennsylvania, composed of the following gentlemen: Messrs. Hibberd B. Worrell, Hon. A. J. Cassatt, Gen. James A. Beaver, H. C. Brackenridge, Hon. W. L. Elkins, and H. C. Snavely. The commission elected Mr. Worrell president, and John Hamilton secretary. There have been several meetings devoted to the discussion of points that ought to be embraced in a proper road law, and investigation is also being made into the best system now in use in this country and abroad. It is believed that a practicable plan can be prepared and ready for presentation to the next Legislature, which meets in January, 1901.

OHIO'S VEHICLE TAX LAW.

THE new license law of the State of Ohio, for cities of the first grade of the second class, contains the following for vehicles:

"All moneys received under the provisions of sections twenty-three and twenty-nine of this act, shall be credited to, and become a part of, the street repair fund of such cities, to be applied to the maintenance and repair of the streets of such cities and to no other purpose."

Section 23. The license tax on every bicycle kept in and used upon the streets of such city shall be seventy-five cents (\$0.75) per annum, and at the time of issuing such license the director of accounts shall furnish to the licensee a plate made of metal or other suitable material having stamped thereon the year for which such license is issued, and such plate shall be attached to such bicycle.

Provided, however, that there shall be no license fee upon any bicycle, where it is made to appear to the satisfaction of the director of accounts, by affidavit, or otherwise, that such bicycle is kept for use by a laborer for the purpose of going to and returning from his work, and where such laborer does not receive more than \$2.00 per day for his services. And the director of accounts shall furnish free to such laborer a distinctive plate made of metal, or other suitable material, having stamped thereon the year for which the same is issued, and such plate shall be attached to such bicycle.

Section 29. All persons, firms or corporations using any vehicles on the streets of the city shall pay annual license fees upon all such vehicles as follows:

- For each sulky, three dollars (\$3.00).
- For each cab or hack, five dollars (\$5.00).
- For each buggy or private carriage, three dollars (\$3.00).
- For each hotel coach or carriage, seven dollars (\$7.00).
- For each furniture car or van, seven dollars (\$7.00).
- For each two horse omnibus, seven dollars (\$7.00).
- For each four horse omnibus, ten dollars (\$10.00).
- For each six horse omnibus, fifteen dollars (\$15.00).
- For each cart drawn by one horse, three dollars (\$3.00).
- For each cart drawn by two horses, ten dollars (\$10.00).
- For each wagon (with springs) drawn by one horse, three dollars (\$3.00).
- For each wagon (with springs) drawn by two horses, seven dollars (\$7.00).

Automobile Department.

FIRST AIDS TO AN AUTOMOBILE MOTOR.

As in the case of the battery, the best assistance possible should be secured in case of any accident to the motor. If the carriage fails to give good results at any time, and you are sure the fault is not in the batteries, if an electrical engineer is not accessible, there are a few simple things to be gone over which may cure the difficulty. There are also symptoms of disease which, if taken in hand at an early stage, save trouble at an even greater ratio than the proverbial "stitch in time."

While it would be very difficult to find a person who does not know that a magnet will attract steel or iron, few know that it will also attract copper if a current of electricity is passing through it. This one fact underlies the whole system of electric motors.

The magnet, instead of being a plain piece of magnetized steel or iron, is increased in power by winding it with insulated copper wire, through which a current is passed, and instead of one wire, the armature consists of many sections, each consisting of coil after coil of insulated wire wound on frames. The several magnets used together are called the field. The armature revolves within the space between the inner ends of the field magnets, and each section is connected with a segment of the commutator. The brushes rest on the commutator, and the current passes in at one brush through a section of the armature and out at the other brush. The brushes are fixed, and so are the magnets. You can see at once that the brushes can easily be arranged so that as soon as the armature section through which the current is passing has been drawn by the magnet to a position nearly under the magnet, the commutator section for that part of the armature will pass out from under the brushes and the next section behind it will receive the current, and so on. Each section of the armature ceases to be attracted by the magnet the instant the current in it stops. In all vehicle motors now on the market the brushes are made of carbon, to reduce the sparking when the brush changes from one armature segment to another.

The first symptom of trouble in the brushes is heating of the coils, caused by a poor contact. The heating will be easily detected by placing the hands on the coils just after the vehicle comes to a stop after running. The blackening of the commutator is another symptom. Inspect the brushes at once. See that the connections are all bright and clean, the brushes held firmly, the springs having tension enough to hold them on the commutator, but not to press, so as to grind the carbon into powder. See that the brushes set squarely, and that there is no grease on the commutator.

The fact of the operation being concealed is misleading in both batteries and motors. A man must not think that they are like a watch, because they are encased. They require constant, intelligent inspection. The lubricating cups must be kept supplied and clean, and if the motor is a ball-bearing one the adjustments of the bearings should be tried.

As fuses and cut outs are impossible on a vehicle motor, it must be built to resist treatment that, in proportion, would ruin a stationary motor. As the severest strain comes on the motor only in times of emergency, such as steep grades, or poor roads, when it will be required to do its utmost, you can see that a fuse might cause serious trouble at a critical moment.

Connecting wires are liable, owing to the jarring and jolting, to crystallize and break; they should be tried to see that they are firm, as well as bright at points of contact.

Water must be kept away from a motor. The accumulation of water in the frame is always liable to cause a grounding of the motor, shutting off all current from the armature, bringing the motor to a dead stop.

AUTOMOBILES TO MOUNTAINS.

THE Eastern Transportation Co., of Portland, Me., has been formed for the purpose of operating an automobile passenger line between Portland and the principal points of the White Mountains, the company owning the sole franchise from and in the city of Portland. The following are the directors of the company: William Odlin, Boston, Mass.; David F. Murdock, Portland, Me.; Edward Preble, Portland; Charles W. Gray, Jackson, N. H.; attorney, the Hon. Edward M. Rand, Portland.

For each wagon (with springs) drawn by three horses, ten dollars (\$10.00).

For each wagon (with springs) drawn by four horses, fourteen dollars (\$14.00).

For each wagon (with springs) drawn by six horses, eighteen dollars (\$18.00).

For each wagon, dray, truck or drag (without springs) drawn by one horse, three dollars (\$3.00).

For each wagon, dray, truck or drag (without springs) drawn by two horses, ten dollars (\$10.00).

For each wagon, dray, truck or drag (without springs) drawn by three horses, twelve dollars (\$12.00).

For each wagon, dray, truck or drag (without springs) drawn by four horses, fifteen dollars (\$15.00).

For each wagon, dray, truck or drag (without springs) drawn by six horses or more, twenty dollars (\$20.00).

For each pleasure carriage seating not more than two persons, propelled by other power than horse power, three dollars (\$3.00).

For each pleasure carriage, seating four persons, propelled by other than horse power, five dollars (\$5.00).

For each pleasure carriage seating from six to ten persons, propelled by other than horse power, eight dollars (\$8.00).

For each wagon, truck or van propelled by other than horse power, of capacity to haul not more than two tons, five dollars (\$5.00).

For each wagon, truck or van propelled by other power than horse power, of capacity to haul two tons or more, ten dollars (\$10.00).

Provided, that none of the provisions of this act shall be held to apply to farmers marketing the products of their own farms; nor shall farmers, gardeners or fruit growers be liable for vehicles or any license whatever for marketing and selling the products of their own farms or gardens, or for hauling any produce into or from said city to the country, in cities of the first grade of the second class; and, provided further, that the director of accounts shall have authority (on the surrender and cancellation of any license issued under the provisions of this section) to rebate and refund a pro rata amount of the cost of such license for the unexpired term for which said license has been issued; and provided further, that the director of accounts shall have authority to issue license for the fraction of any year, upon receiving satisfactory evidence that the vehicle licensed has not been in use at any time during the current year prior to the time of making application for such license.

Dairymen living without said city shall pay license fees upon their vehicles used upon the streets of said city as follows:

For each one horse wagon, three dollars (\$3.00).

For each two horse wagon, five dollars (\$5.00).

For each three or four horse wagon, ten dollars (\$10.00).

And be it further provided, that all persons or firms using any vehicle upon the streets of any such city for which annual license fees are required by law to be paid, shall exhibit in a conspicuous place upon the left side of each vehicle, or upon the left side of the harness of an animal or team attached to the same, a metal plate sign, furnished by the director of accounts, indicating the year for which such license has been taken, and the number and character of such license. And the director of accounts, in cities of the first grade of the second class, is hereby required to furnish with every license issued for such vehicle used upon the streets of such cities, at the time of issuing the license, one metal plate sign having printed, painted or stamped thereon the year for which the license has been taken out, together with the character and number of the same.

Provided also, that any person who shall purchase any vehicle upon which the vendor has paid a license, may, upon presenting to the director of accounts an affidavit of such purchase, use such vehicle during the time for which such license shall have been paid, without payment of additional license.

Section 30. If, at any time, any of the metal plates issued by the director of accounts, as provided in Sections 22, 23 and 29 of this act, shall be lost or stolen, the holder of the license, with which such plate was issued, by making application to the director of accounts with an affidavit that such plate has been lost or stolen, and paying to the director of accounts the sum of fifteen cents (15c.), shall be entitled to receive a new plate for the remaining portion of the current year.

Section 31. Any person who, acting for himself, or as a member or agent of any other person, firm or corporation, shall violate any of the provisions of this act, shall be guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine of not more than one hundred dollars (\$100.00) nor less than ten dollars (\$10.00) or to be imprisoned for not more than six months, or both.

Automobile Patents.

FRED J. NEWMAN and JOSEF LEDWINKA, Chicago, Ill. No. 638,643. Patent dated December 5, 1899. Illustrated by Fig. 59.

Claim.—1. In a vehicle propelled by electricity, a combination of the hubs of the wheels of said vehicle inclosing each an electric motor, said motors journaled on the axles of said vehicle, the shells of said hubs, which shells contain each a motor field magnet, journaled on an axle, the armatures of said motors connected each by gear wheels with its hub shell, the intermediate gear wheels between said armatures and said hubs each journaled on a bracket, said

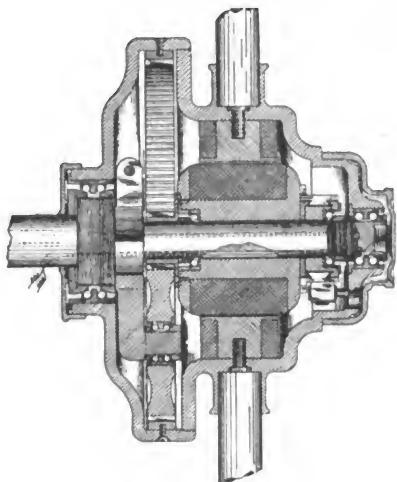


FIG. 59.

brackets rigidly fastened to the axles of said vehicle, whereby when said armatures are revolved, the revolving motion thereof would be transmitted to the wheels of said vehicle.

2. In a vehicle propelled by electricity, a combination of an electric motor, said motor inclosed in a hollow hub of a wheel of said vehicle, the armature of said motor journaled on an axle of said vehicle, said hub also journaled on said axle, the armature of said motor supplied with geared driving connection with an internal gear, said internal gear firmly attached to the interior of said hub, the

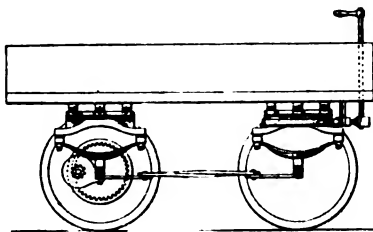


FIG. 60.

intermediate gear wheel of said geared driving connection supported on a bracket, said bracket firmly attached to said axle, the fields of said motor securely fastened to the interior of said hub, whereby when said armature is revolved, the revolving motion thereof would be transmitted to said hub.

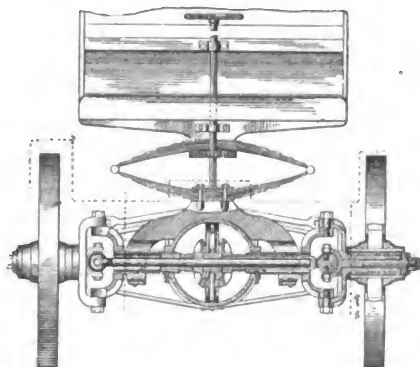


FIG. 61.

CHARLES W. HUNT, New York, N. Y., was granted a patent on a motor vehicle, dated January 16, 1900, No. 441,514, illustrated by Fig. 60.

Claim.—1. In a vehicle, the combination of wheels mounted to swing about a substantially vertical axis, independent driving mech-

anisms for said wheels, means to control said driving mechanisms whereby one of said wheels is retarded or accelerated with relation to the other of said wheels, and means to retard or check the swinging of the wheels.

CHARLES T. HILDEBRANDT and FRANK R. McMULLIN, Chicago, Ill., were granted a patent on driving and steering mechanism for motor vehicles, dated January 16, 1900, No. 641,511, illustrated by Fig. 61.

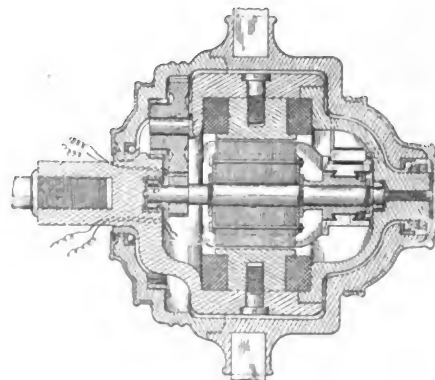


FIG. 62.

Claim.—1. The combination with a frame for supporting the front part of a vehicle body, of a rotative shaft mounted in said frame, shaft sections joined to said shaft by universal joints, and hollow stub axles pivoted to said frame by vertical pivots separate from and in vertical alignment with said universal joint, the shaft sections passing through the stub axles and being operatively connected with said hubs at the outer ends of the stub axles.

FREDERICK J. NEWMAN and JOSEPH LEDWENKA, of Chicago, Ill., were granted a patent for an electrically propelled vehicle, dated January 16, 1900, No. 641,603, illustrated by Fig. 62.

Claim.—1. A combination of an electric motor mounted on a vehicle axle, a hollow hub of a vehicle wheel inclosing said motor, said hub journaled about said motor, the armature of said motor connected with the interior of said hub, so that when said armature is caused to revolve, its revolving motion would be transmitted to the said vehicle hub.

GEORGE WHITNEY, of Boston, Mass., was granted a patent on a motor vehicle, dated February 6, 1900, No. 642,771, illustrated by Fig. 63.

Claim.—1. In a motor vehicle, a receptacle for liquid fuel, means to subject the liquid fuel to feeding pressure by or through thermal

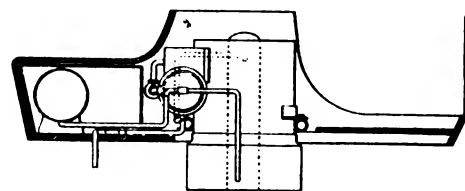


FIG. 63.

action, and a controlling device to automatically govern the thermal action by or through variation of the feeding pressure.

CALL A HALT ON THE AUTOMOBILE.

SOME reprehensible performances in the line of automobile "scorching" have been seen in Rochester, N. Y. A day or two ago, for example, one of these machines, evidently manipulated by an operator who had acquired expertness and confidence, went at a high speed around a corner amid an entanglement of wagons, carriages, hand carts and pedestrians, the situation being further complicated by a moving street car. Nobody was hurt, but there was some pretty lively dodging, and the fact that no accident occurred looked to the spectators like a case of pure good luck. We are unable to see why an automobile, any more than a delivery wagon, has the right to make these reckless dashes. In the case of the latter the driver would be stopped and reprimanded, and possibly arrested, by the police. The automobile operator should be served the same way. He has no exclusive privilege to make the streets unsafe, and should be held strictly within the limits to which drivers of horses are subjected.

Descriptions of Automobiles.

AMERICAN ELECTRIC VEHICLE CO.'S BREAK.

(See illustration on page 108.)

THE very handsome break shown is manufactured by the American Electric Vehicle Co., of New York City. It is built upon correct lines and finished in the finest manner, and in every way furnishes a complete turnout. It is driven by a five-horse power electric motor, and has a speed capacity from starting to twelve miles an hour. The front wheels are 34 inches, and the rear wheels 36 inches high. It is intended for six passengers.

DE DION-BOUTON MOTOR CARRIAGE.

(See illustration on page 108.)

IN our May number we published an illustration of one of this company's motors as it appeared in the race on Long Island. Our illustration this month shows the vehicle to far better advantage. It is a typical French machine, and the motor takes rank among the most successful made. The American agency is located at Boston, Mass., and is in charge of Kenneth A. Skinner, who alone is authorized to sell the De Dion-Bouton motor in the United States. The photograph from which the illustration was made was taken before Mr. Skinner's office.

DURYEA AUTOMOBILES.

(See illustrations on page 112.)

THE Duryea Power Co., of Reading, Pa., is composed of Reading capitalists, having Herbert M. Sternbergh as president, Charles E. Duryea, vice-president, and Henry Millholland, secretary and treasurer. They have arranged with the Duryea Manufacturing Co., of Peoria, Ill., for rights to manufacture certain classes of the well known Duryea vehicles, having decided to adopt this system after a long and careful expert examination of the various vehicles of all classes, both in this country and abroad. Their new factory is situated on North River and Hockley streets, on a large lot; is well lighted and ventilated, and is but four blocks from the Pennsylvania and Philadelphia & Reading depots.

The Duryea system combines light weight, high power, great simplicity and extreme ease of control. Four passenger traps weigh about 800 to 900 lbs., light delivery wagons weigh less than 1,000 lbs., while phaetons will be built as light as 600 lbs. All these vehicles use triple-cylinder six-horse motors, with hill climbing and reverse gear on the motor shaft and a single chain connecting the motor shaft with the rear axle. This arrangement avoids counter-shafts, avoids all extra bearings, prevents any twisting or rocking of the framework, liable to produce noise or add friction, and permits all the working parts to be in full sight and easy reach of the operator when the top of the carriage is lifted. All seats are made detachable, so that the entire mechanism can be exposed quickly. This ability to get at the machinery renders the care of a Duryea vehicle a matter of pleasure and insures that the parts will be kept in good condition, able to render the most efficient service. The high power, together with the light weight, enables these vehicles to traverse mud, sand, snow and hills, and also gives them a speed ability second to none.

A two passenger cab will weigh less than 1,200 lbs. They are of small size, light weight, high speed and short length, which will make them especially valuable in the busy part of town, where congested streets are the rule.

Directly in front of the Duryea Power Co.'s factory is the Schuylkill River, with ample water for boating, on which a light launch fitted with one of the Duryea motors may be usually found. The great power of these motors will perhaps be better appreciated when the results obtained from them in boat use are known. They drive a little open launch 18 feet in length by 4½ beam, one mile in 6.20 min. flat, with two persons aboard, which is believed to be the fastest launch of its size in the country. One of the features of the Duryea vehicles is the single steering wheel, believed by the makers to be the best thing for the purpose yet shown, although they furnish double steering wheels to order.

Another special feature is their central controlling handle, by which the steering, changes of speed and the throttling of the motor are effected by a single hand. This lever is placed between

the two forward riders and may be operated by either at will. A foot brake is likewise centrally placed. Fuel and water for 100 to 200 miles may be carried. The noise is very little in evidence, so much so that on an ordinary busy street these vehicles cannot be heard. The quality of the mixture is under the control of the operator at all times, and with a little care no odor need be produced. The Duryea vehicles have been before the public since 1895, and have won all open road races in America where entered. Abroad they have won the Liberty day run in England, beating the winners of the Paris-Bordeaux race, and in Belgium, last fall, two Duryea vehicles won over five Panhard & Levassor's in a 100 kilometer race.

ELECTRIC VEHICLE CO.'S NEWSPAPER DELIVERY WAGON.

(See illustration on page 110.)

THIS wagon is designed for general delivery purposes, and is used by the *New York Journal* for delivering the various editions of the paper to different city stations. The motor is driven by powerful electric batteries, which propel it loaded to the highest speed allowed by the city. It performs its work satisfactorily.

RIKER EMERGENCY WAGON.

(See illustration on page 113.)

THE large emergency repair wagon shown was manufactured by the Riker Motor Vehicle Co., of Elizabethport, N. J. This wagon was made for the Metropolitan Railroad Co., of Washington, D. C., and is fitted up with every appliance for making trolley repairs. It is electrically propelled, is provided with powerful batteries, and is in every way a model vehicle for the purposes for which it is intended.

FISCHER MOTOR VEHICLE CO.'S TRUCK.

(See illustration on page 113.)

AMONG the many attempts to overcome the various defects in electricity and gasoline, as motive powers for automobiles, what appears to be one of the most practical is that employed on the Fisher auto-truck, now running in New York City. The prime source of energy is gasoline. The 12 horse-power thus generated is, by means of a dynamo, transformed into electricity. To each rear wheel is geared a 7.5 horse-power motor. The motors are guaranteed to carry 100 per cent. overload for one hour, and will in case of emergency (for a short time) go up to 40 to 50 horse-power, or more.

When running the wagon under ordinary conditions most of the electric current goes directly from the dynamo to the motor, but when coasting down grade, slowing up, or in general when less power is needed than what is furnished by the engine, the surplus current is automatically taken care of by the storage battery, which is connected to the wiring at a point between the dynamo and motors. Again, when more power is needed than that furnished by the engine, the batteries make up the deficiency.

The principle of this combination is claimed to overcome all the defects of either power taken alone. They are as follows: As the charging of the battery is accomplished by the machinery carried, the range is not limited to a certain distance from a power station, the vehicle being able to go over any passable road. A series parallel controller is used, and any speed, from the maximum down, may be obtained, either forward or backward. The continuous operation of the gasoline engine causes saving in gasoline, while obtaining maximum results; also prevents the usual bad odor, by having better combustion. No governor is used, as the load is always the same, and as the speed is practically constant the engine can be perfectly balanced, preventing all vibration. Another advantage is the ease with which the engine can be started. This is accomplished by means of a switch connecting with the storage battery, thus saving the operator from any effort in starting. The weight of the machinery is not as great as might at first glance be supposed, the engine being much smaller than what would be required to operate the vehicle if the power were gasoline direct. The cost of operation is 2½ cents per mile on average roads. The trucks weigh from three to four tons, and are capable of carrying from five to eight tons. The company are now getting up plans for building trucks to carry ten tons. They will climb any grade that a similar vehicle drawn by horses can, and at a greater speed.

The maximum speed for trucks is usually six miles, but the 'buses, also built by the Fischer Motor Vehicle Co., will travel nine miles or even faster. The address of the company is 220 to 224 Grand Central Passenger Station, Chicago, Ill.

GASOLINE LIGHT DELIVERY MOTORS.

(See illustration on page 109.)

THE light delivery wagons shown are manufactured by the New York Electric Vehicle Transportation Co., of New York City. They are intended for special work, where the load carried is comparatively light. The company has been experimenting with these motors for several years, correcting defects as they have developed, and they feel confident that they have a light delivery vehicle that can be depended upon to do what is required of it, and at a minimum expense. As will be seen, the two shown are for delivery of two leading daily journals. They use gasoline for fuel, and being easily controlled they appear to possess the requisite power and capacity for the work to be performed. A full description of these small gasoline delivery vehicles is given elsewhere, in an article headed "Gasoline Automobiles for Light Delivery."

QUICK MANUFACTURING CO.'S PHAETON.

(See illustration on page 111.)

THE Quick Manufacturing Co., of 3 to 7 Oliver street, Newark, N. J., manufacturers of gasoline vehicle motors and special fittings for motor vehicles, have produced a motor which they claim to be perfectly reliable, and are prepared to give with each a full guarantee that any and all parts proving defective or failing from actual use will be replaced for a term of one year from date of sale. They can furnish anything in the line of accessories for the automobile, and a special high speed engine oil and special oil for parts of vehicles. The vehicle shown on page 111 was built for the purpose of demonstrating their motor and testing its capabilities. They do not build vehicles.

WASHINGTON ELECTRIC VEHICLE TRANSPORTATION CO.

(See illustrations on pages 106 and 107.)

THE two full pages of illustrations—106 and 107—show a line of vehicles used by the Washington Electric Vehicle Transportation Co., of Washington, D. C., who operate under a license from the Electric Vehicle Co., of New York. This company has the exclusive right for the distribution of Columbia automobiles in the District of Columbia, and have established a list of prices for this kind of service by the month, which price includes a competent driver, with suitable livery or uniform for the service required, also rates per hour. The Baltimore & Ohio Railroad have established the electric vehicle service, and electric vehicles will be in attendance upon all trains of that railroad at station, New Jersey avenue and C street, and will deliver passengers and baggage therefrom to points in Washington City at moderate rates. The railroad company use the electric brougham for passenger service, and give a service to travelers that is second to none in the country.

WINTON GASOLINE MOTOR CARRIAGE.

(See illustration on page 111.)

THE Winton Motor Carriage is the result of long experience in the manufacture of horseless vehicles, and has been evolved by practical road tests under the most severe conditions. It is not an experiment, but a demonstrated success. The hydro-carbon (gasoline) system of propulsion is employed, combining the greatest economy with absolute safety of operation. This system is the one almost universally used in foreign countries, as best adapted for pleasure or touring purposes. Common stove gasoline, used for the motor, can be obtained almost anywhere, and the cost of operation is extremely low. The cost of running, per mile, varies of course with the condition of the roads, the speed maintained, the load carried and the grades ascended, but is the result of a long series of tests over all kinds of country roads.

A motor carriage may be well enough adapted for use on the asphalt and smooth streets of a city, and yet be wholly unfit for touring or general country use. The automobile made by the Winton

Motor Carriage Co. is an all-around vehicle for use in city or country, and over any road open to ordinary traffic. Mud, snow, sand and hills offer no serious obstacle. The recent run made by an ordinary Winton carriage from Cleveland, O., to New York, 707.4 miles, in forty-seven hours and thirty-four minutes, illustrates what this automobile is capable of doing on American roads. At the present time a single seated phaeton at \$1,200, for two persons, and a double seated surrey at \$1,500, are the models which they are turning out. The motors are strong, and capable of driving the carriage at a good speed. The carriages are highly finished, only the best quality of material being used. So many orders are being booked that parties desiring carriages for spring and summer use should order immediately. An opportunity is given all who desire to test the carriage in a thorough manner, with a view of purchasing. Appointments may be made with the Winton Motor Carriage Co., eastern department, in the Arcade at 120 Broadway, or at the uptown office, No. 57 West Sixty-sixth street, New York City.

WOODS MOTOR VEHICLE CO.'S DELIVERY WAGON.

(See illustration on page 110.)

THIS large delivery wagon was manufactured by the Woods Motor Vehicle Co., of Chicago and New York, for the *New York World*, and is one of that company's most complete vehicles. It is built for heavy and quick work, and is speeded up from start to twelve miles an hour. It is provided with the latest improvements, and is in every way an ideal type of motor delivery wagon. It has a five horse power electric motor, of the Woods type, and is finished in the finest manner.

MAKING RECORDS.

SUNDAY, May 6, was a red letter day for the Aster motor. The following are some of the firsts that it won:

At the Parc des Princes in Paris, in the one hour race, Osmond won first on a tricycle fitted with an Aster motor, beating Beconnais, Fossier, Rigal and others.

At Tours, Demester, on a tricycle fitted with an Aster motor, won first place. Clement, also with a tricycle fitted with an Aster motor, won second place.

In the Hamburg-Kiel and return road race, Schultz, on a tricycle fitted with an Aster motor, won first prize. At Berlin, "Roue d'Or" was won by Taylore, paced by an Orient tandem fitted with the Aster motor.

AUTOMOBILE CORPORATIONS.

THE VIRGINIA AUTOMOBILE Co., of Alexandria, Va., has been organized, with a capital stock of \$100,000, by C. A. Lieb, J. B. Lackey, G. H. Harris and others.

THE MOTOR CYCLE Co., of Norfolk, Va., has been incorporated, to manufacture automobiles. The company is capitalized at \$750,000 and has the following named officers: President, Ansel L. White, of New York; treasurer, Frederick Stewart, of New York; secretary, Benjamin J. Downer, of Montclair, N. J.

TRENTON, April 30.—The Cosmopolitan Power Co. was incorporated to-day, with a capital stock of \$40,000,000. This company will deal in engines and vehicles of all kinds, operating and constructing the same. The incorporators are: George E. Hargrave, Henry E. Mattison and William H. Wilson.

THE PAINESVILLE AUTOMOBILE Co., Painesville, O.; capital stock, \$10,000.

THE ELECTRIC AUTOMOBILE Co. filed incorporation papers with the County Clerk on April 20. The incorporators, who are also named as directors for the first year, are William H. Smith, Charles S. Rodgers and William E. Humphreys. The company will operate principally in Arapahoe and El Paso counties, with the principal office in Denver. The company is capitalized at \$30,000, shares having a par value of \$1 each.

THE first company of all Maine incorporators to manufacture automobiles has been organized and the certificate filed at the office of the Secretary of State. The incorporators are all Maine men, and the presumption is that the people of Eden are to manufacture automobiles instead of buckboards for the use of Bar Harbor people. The company is the Boston Automobile Co., organized at Eden, for the purpose of making and selling automobiles, with \$100,000 capital stock, of which \$300 is paid in. The officers are: President E. Shirley Goddard, of Eden; treasurer, Frank Pinkham, of Eden.

GASOLINE AUTOMOBILES FOR LIGHT DELIVERY SERVICE.

THERE are a great many small stores, laundries and other small business establishments, not only in the larger cities, but also in towns of moderate size and in suburban districts, the requirements of which for delivery service do not call for as great carrying capacity, either in bulk or weight, as is furnished by the electric delivery wagon. To meet the demand from this quarter, and also to assist in handling the delivery service of large establishments, such as department stores and others, for the major part of which electric wagons, or the old-fashioned horse-drawn wagons are regularly employed, a little gasoline automobile was put out by the Pope Manufacturing Co. nearly two years ago. In spite of the novelty of the gasoline vehicle in this work, and notwithstanding the unfortunate ignorance which still exists in many quarters as to the possibilities and limitations of all automobile vehicles, this small machine has slowly and surely been working out a good reputation for itself. It is believed that incidentally it has done some educational service in the gasoline automobile field. In any case there is evidence that it has developed in several of the individuals owning these machines a desire to own as well a passenger vehicle of similar economy and convenience in operation. This gasoline motor delivery vehicle is a tricycle, the front wheel being used for steering, and the two rear wheels for drivers. It is now being manufactured for the Electric Vehicle Co., of New York, by the Columbia and Electric Vehicle Co., of Hartford. As an example of the trend which gasoline mechanical constructions are taking by force of American conditions, which are certainly in many cases widely different from the conditions prevailing in France, where gasoline automobiles are growing daily in popular favor, not slowly, but by leaps and bounds, some of the features of this tricycle are of interest.

It is driven by an Otto cycle engine, with cylinder measuring $3\frac{1}{2}$ in. x $3\frac{1}{2}$ in. The engine is started by ordinary bicycle pedals operated from the rear saddle, on which the driver sits, the pedals being also, however, available for use to assist in the propulsion of the machine when required for this purpose by an abnormally steep grade or the necessity of an unusual output of power for any cause. As first placed on the market the engine was entirely air cooled, and lubrication was automatic from a single charge of oil, which was supposed to be placed in the crank case of the engine once a day.

After a year's experience it was found that much of the service to which the machine naturally gravitated was what might be called the "peak" of the load for large department stores, and service sometimes calling for hurried deliveries of packages in comparatively small numbers, besides the other classes of work for which it was planned. As a rule, no extremely heavy load being carried for any of this service, it became possible to run the machine at its highest speed, and hence at the end of a year the severity of the service on the engine was found to exceed what it would have been if greater loads had been carried.

As a result of this experience it was found that this size of engine, running continuously with a cylinder and explosion chamber, merely air cooled, would become overheated. Hence a water cooled cylinder head was adopted, which resulted entirely in doing away with this difficulty, decreasing the cost of maintenance and increasing the capacity of the tricycle. It was also found that many of the drivers employed on these machines by their owners were boys, and could not be relied upon to invariably give the matter of lubrication the attention it deserved. A charge of oil was put into the crank case whenever the driver happened to think of it, which frequently he did not do for several days. One of the objects in building it has been to render it as simple as possible, even at the sacrifice of refinements in the line of automatic features. Therefore, in order to overcome the difficulty resulting from lack of attention to the necessity of daily oiling, it was considered advisable to mount a sight feed oil cup directly on the handle bars of each machine, and run from it a little tube to the engine gear case, so that whenever the driver mounted the machine the oil cup could not fail to be conspicuous, and suggest to him that oil was needed in case it happened to be empty. Further, a sure and gradual feed of the oil was found to render very slight indeed the maintenance expense in cylinder packing rings, the wearing parts within the cylinder, and the crank case.

Of course, for winter use in cold climates the oil has a tendency to thicken in the tube between the oil cup and the crank case, but wherever required this is easily overcome by mounting the oil cup

over the top of the engine, where the heat is bound to keep the oil thin enough to feed properly. The cup is still conspicuous enough there to remind the operator that if a horseless carriage does not needs oats, it does need oil.

While on the subject of oil, it may be of interest to many prospective users of gasoline automobiles to be informed of the desirability of obtaining for use in the cylinders of small gasoline engines an oil which will both furnish good lubrication at high temperatures and at the same time not incrust in the cylinder. If oil not carefully selected is used here it will cake up in thin layers in the cylinder over the piston, and these incrustations are liable to become red hot, thus causing premature ignition. The Columbia people claim that after many careful tests of lubricating oil they have succeeded in finding an oil which is entirely satisfactory for service here.

For ignition, both the means involving the use of a red hot platinum tube and of an electric current, supplied by a battery and otherwise, were tried. It was found that while the hot tube method has several obvious advantages, the wick in the hot tube burner would gradually become charred, and affect the flame to such an extent that the tube could not be maintained at a high enough temperature to give the right point of ignition. Of course, this resulted in lack of power and speed, and inability to cover distances in a reasonably short time. It also rendered the machine less attractive from the point of view of owners who desire to place it in the hands of drivers without any especial mechanical experience or insight. This objection, together with the advantages that would come from the possibility of making an instantaneous start, led to the adoption by the makers of electric ignition. The greatest difficulty here was the source of current. The magnetic igniter, in the hands of drivers of such vehicles, and especially on vehicles unprotected from the weather, as this machine is, would hardly be practical. Primary batteries of all descriptions were tried, but without success, and finally a two-cell storage battery of an ampere hour capacity of fifteen was found to be the best and most satisfactory. A secondary or jump spark is used with a non-vibrating coil. This ignition gives excellent results, and if explicit rules laid down that a new storage battery must be substituted every Monday morning are followed, and the exhausted ones recharged, it is almost impossible to damage it.

The method of control involves the varying of the point of ignition. The lever by which this is done has a spring return to the position which insures the engine running slowly. It is placed to be operated by the knee of the driver when he mounts the machine. The ignition is early enough to start with the lever held back as far as it will go, unless the mud is too deep or the grade too high. If necessary to advance it, either in order to start under adverse conditions, or to speed up, the driver only needs to push the lever forward with his knee. Of course, when he dismounts from the machine, the spring return lever instantly brings the ignition back to a point low enough to avoid racing the engine. This has proved on long service to be a valuable means of adding to the durability of the motor and its wearing parts, and certainly adds to the claim made by the company that their gasoline tricycle is as simple and as proof against injury due to carelessness or inexperience as any gasoline automobile can be made. With the two speeds provided for the machine by the change gear, this method of varying the speed is adequate to furnish all the variations in rate of movement which are called for. Experience has indicated that it is more economical and otherwise satisfactory than the throttle control, which was also tried. In the majority of instances, the boys hired to drive the machines would entirely forget to open the throttle in starting, or to close it when throwing out the clutch. Of course, in the first case the machine simply did not start, and in the second case the engine was allowed to run without carrying any load, at an injurious rate of speed. With the method of ignition control described the throttle is left wide open, and while in theory the use of gasoline is not in this way kept at a minimum, in practice it has been shown that by keeping the speed of the engine at the lowest point the cost of gasoline per mile is in reality less than with a throttle. The carburation is by a surface carburetter of the standard type.

It is not necessary to say that the maintenance expense per annum of such a vehicle needs to be made low, in order to suit the management of a dry goods department store. If the user of one of these machines will provide himself with gasoline of the proper test degree, which, by the way, is exactly the same quality of gasoline as is regularly used in gasoline launches of the leading manufacturers, if he will have the machine overlooked by the foreman in his delivery department, or some other fairly responsible person with a

little mechanical insight, and if he will employ a boy of average intelligence to run it, the Columbia company claims that it has been demonstrated that this little business vehicle will prove practical and reliable.

One of the large department stores in a Pennsylvania city made in the course of its regular service with one of these tricycles during the week ending February 10, the following records for three different trips:

First trip, thirty-two packages delivered in sixty-five minutes, distance about four miles.

Second trip, thirty-one packages delivered in seventy minutes, distance about 4½ miles.

Third trip, thirty-one packages delivered in ninety minutes, distance about six miles.

Another of these tricycles during the week preceding Christmas was run steadily each working day, and delivered each day a number of packages varying from seventy-four, the minimum for one day, to 110, the maximum for one day. These figures, however, fail to convey an accurate idea of its possibilities, as it is almost invariably used for long distance service, and for reaching points to which it would not pay to send a horse-drawn wagon or an electric wagon without a full load.

The tricycle feature of the vehicle makes it possible to guide it accurately where very little space is available for movement and turning. It can thread its way through an ordinary traffic in localities where it is intended for use. Its total weight is 900 pounds, and it carries enough gasoline on a full charge of the tank to provide for running 100 miles, and enough water for twenty-five miles. It has a maximum carrying capacity of 500 pounds, and with this load can easily be made to average in city service over eleven miles per hour. The appearance of the machine is shown by the illustration in the advertisement of the Electric Vehicle Co., 100 Broadway, New York City.

THE ONE THOUSAND MILE RUN FROM LONDON TO EDINBURGH AND BACK.

AUTOMOBILE races wherein speed is the one object have been indulged in for several years past, but as the element of chance entered so largely into the results the races did little more than to keep up the public interest, without demonstrating the practicability for pleasure or business purposes. So far, neither type has shown a superiority that entitles it to a first place, while each has developed serious faults, due to faulty construction. The English automobilists must be credited with being the first to submit the machines to a test that would demonstrate their value for actual use. With this object in view a run of 1,000 miles was projected by the London, Eng., Automobile Club, starting from London and running by the way of Bristol, Birmingham, Manchester, to Edinburgh, thence returning by the way of Newcastle, Leeds, Nottingham, to London.

The start was made at 7 o'clock on the morning of April 23, running at the rate of about ten miles an hour, ending the first day's run at Bristol, a distance of 118½ miles, somewhere about fifty machines making the course, among which were about every type that has been developed, and almost every size from the 4,000 pound, sixteen passenger, twelve horse-power char-a-banc, to the 2½ horse-power tricycle.

The most expensive machine in that great run was a one-horse Napier, which only takes two passengers, including the driver, and costs £1,300 (\$6,500), while the cheapest was a diminutive tricycle, No. 12 of the Motor Manufacturing Co., of two and a half horse-power, at £75 (\$375).

By far and away the most curious machine was a pointed headed autocar of dull gray, which was variously called by the crowd "the ram," "the torpedo" and "the shark's mouth." It was a weird looking thing, made by Vallée, of Le Mans.

The moderate pace gave an opportunity to test the merits of the motors as to their reliability, and as there were but two breakdowns on the first day's run no serious defects could have existed. The scheduled time was maintained each day, and stops were made for a day or more, for the purpose of exhibiting the machines in various large cities.

At some points the steep hills tested the climbing abilities of the machines to their utmost; but as the mishaps were few the test was accepted as a success, although to the surprise of many the steam cars fell short of what was anticipated. The following are the official results of the best performances in the hill climbing competition up Berk Hill on Wednesday, May 2.

The Hon. C. S. Rools, Panhard, sixteen miles an hour; Quadricycle, 13.3; Ariel tricycle and trailer, 12.6; Motor Manufacturing Co.'s tricycle, 12.6; Enfield quad, 12; Mr. Kennard's Napier, 11.5; Mr. Holder's Daimler, Mr. Friswell's Peugeot, a Century Tandem, locomobile steamer and De Dion Voiturette, all 10.9 each; the Hon. James Montague's Daimler, 10.4; Mr. Matthews' Peugeot, 10; Motor Manufacturing Co.'s Triumph, 9.6; Brown-Whitney steamer, 8.9; Mr. Hargreave's Daimler, 8.9; Mr. Brown's Panhard and the Deauville, 8.6 each; Mr. Exe's Daimler, 8.2; No. 37 Daimler, 8; De Dion voiturette, 8; New Orleans, 7.7; Lanchester, 7.7; Richard, 7.5; Mr. Phillips' Mors, 7.5; Gladiator voiturette, 7.5, and Mr. Liddeley's Daimler, 7.

After a day's stay in Edinburgh the fifty cars left that city on May 4 for Newcastle-on-Tyne, a run of 121½ miles on the home trip. Six vehicles gave up the trial on this run. The final run home was made on Saturday, May 12, from Nottingham to London. At St. Albans the leading cars made a halt, to enable all to be massed for the last two hours' run. They started at five o'clock.

The Hon. C. S. Rools' car acted as pilot, and no one was allowed to pass him. Large numbers of people collected on the line of route through Hendon, Kilburn and Maidavale, and great interest was excited by the procession along to Edgeware Road, Oxford street, Regent street and through Trafalgar Square to the Automobile Club premises, in Whitehall Court.

By seven o'clock about three dozen cars had arrived, and the others came in in detachments to the number of about fifty.

All the cars that went through the trial traveled a minimum of 1,059¼ miles, while some of them totaled 1,107½ miles. There were eleven actual running days after the competing vehicles left London, on April 23, the balance being made up of Sundays and one day exhibitions. On seven days out of the eleven a hundred miles or more was the distance traveled. The longest was the journey from Nottingham to London, and the shortest was the 61½ mile run from Kendal to Carlisle, which included the hill climbing competition up Birkhill. The run from Nottingham was as successful as its predecessors, and brought the trial to an effective finish.

AUTOMOBILES IN GERMANY.

THE automobile industry, though still in its infancy, is being rapidly developed, and is destined to become an important factor in the manufacturing circles of Germany, says Consul Warner at Leipzig in a recent report on this subject to the State Department. The large amount of capital and energy that is being expended by German business men, the most conservative financiers in the world, upon this industry indicates great confidence in the future of automobilism. In France, where automobiles were first considered seriously, the chief aim has been toward obtaining excellence in sporting and luxurious automobiles, but in Germany a directly opposite state of affairs exists, and the efforts there have been to further the manufacture of freight automobiles for transportation and freight carrying. Electricity and benzine are used almost exclusively as motive powers, and preference is shown for the former. The benzine automobile is more desirable for transporting heavy loads, the consul says, but the present high price of benzine and the prevalent, though unfounded, fear of explosion of the benzine motor, have made the electromobile the favorite.

CONTROL OF AUTOMOBILES BY LICENSE.

THE *News*, of Chicago, says: "It is estimated that there are not over 200 automobiles in use in the city, and of these all but some thirty or thirty-five are licensed. The unlicensed vehicles are owned chiefly by private persons and used for pleasure purposes. It is precisely this class of persons who need to be looked after most closely. The owners of electrical carriages who rent them for hire find it to their interest and convenience to comply with the law, and even if they did not it would be a comparatively easy matter to compel them to do so, as their stables or stations are known, and can be visited daily by an inspector. The private person who owns one of the new conveyances is apt to regard it as a matter of little importance whether he complies promptly with city regulations as to licenses and speed. The automobile, however, running at eight miles an hour—the limit allowed by ordinance—is a powerful machine, and the danger from accidents to pedestrians through an unskilled driver is too great to be permitted."

AUTOMOBILES UNDER THE HAMMER.

THE *New York Herald*, in its European edition of May 20, says: A new departure in the progress of automobilism was made yesterday in Paris, the occasion being the first public auction sale of automobiles at Chéri's branch establishment at Neuilly.

The fact that Prince Pierre d'Arenberg, M. Edmond Blanc, Comte Gérard de Ganay, M. Michel Ephrussi, Comte de Beaumont, Vicomte Foy, Baron de Dietrich, Vicomte de Périgny, Marquis de Balleroy, Prince Obidine and others were willing to dispose of their automobiles was sufficient to take out to Neuilly a large attendance. The Automobile Club was largely represented, the president, Baron de Zuylen, and a considerable number of members being present.

A large majority of the automobiles for sale did not change hands, the upset price not being reached, but some idea of the value of the machines sent for sale may be gathered from the fact that the various bids aggregated over 300,000f.

"I am perfectly satisfied with the results," said M. Halbron, head of the firm of Chéri's. "I said before the sale that if we disposed of only one machine I should be satisfied with the experiment, and the results exceed my expectations. Attention has been called to this mode of disposing of automobiles, and the new movement has called forth good support from chauffeurs.

"Only a few minutes ago a prominent member of the Automobile Club came up to me and assured me that he would like to send several of his machines to be sold at auction, and his example was followed by several others present.

"While some good prices were realized in several cases, there was shown a disposition to hold for higher prices. No doubt several owners sent up their automobiles to ascertain what prices would be offered at public auction. I hope within a fortnight to have another lot of automobiles to dispose of."

The question of holding an auction for automobiles was widely discussed by the chauffeurs present. The opinion was unanimous that the idea was a good one.

Baron de Zuylen, president of the Automobile Club, said: "The auction sale to-day marks an important point in automobilism in France. The effect of a sale such as the present one will be good. Machines will be sold at prices within the reach of all. The automobiles offered for sale to-day were all good machines. The reason why the owners are willing to sell them is that they want to buy newer and later models."

"Is the sale in any way due to the strict way in which the new regulations against excessive speed of automobiles in Paris is enforced?" I asked.

"Not at all. The sale is a new enterprise, which will prove to the advantage of the public who desire to have a useful, satisfactory automobile at a moderate price, and of enthusiastic chauffeurs who desire to keep in the foremost rank with new types and models, and who have now a very simple way of disposing of models of an older type."

Baron de Dietrich said: "The idea of an auction sale of automobiles is a good one. The movement will be popular, because it will take the automobile business out of the hands of intermediaries to a very great extent. Perhaps if this sale had been more widely known before the auction better prices would have been realized."

M. Charron said: "I tried an auction sale a year ago, but have not cared since to repeat the experiment, since I let my machines go for prices much under their value, and I estimate my loss by that sale at 15,000f. Buyers at auction sales want to get a good thing—in other words, they want to get a valuable machine at a price much lower than the machine is worth."

A REMARKABLE INVENTION.

PROFESSOR REULAUX, the world's authority on applied mechanics and founder of the science of kinematics, said ten years ago in his lectures: "A mechanical device which would enable working machines to adapt themselves automatically to the different conditions of work would be the ideal solution of economical use of force, and I hope some day a mechanical genius may arise to solve this far-reaching question for the benefit of mankind."

Such an invention has been perfected, and the device is now in use in Hartford, where so many inventors prosper. As any layman in mechanics knows, there is hardly existing to-day a machine which has a constant amount of work to do. As different work always requires different power, the designer tries to get the best efficiency

out of his machine, i. e., the highest capacity for turning out work, by speed changing devices such as can be seen on every lathe.

There are now existing two kinds of speed changing devices: One kind, which can be set to any speed, but only work by friction, and therefore can only transmit a limited amount of power. The other sort transmits power positively, but only for a very limited number of steps. The device which has been shown us transmits the power and speed at any desired ratio, and gradually changing, can be set or allowed to adapt itself automatically to the conditions of work to be done, always transmitting the power positively.

This is an absolutely new principle, which has never been achieved by mechanical engineers before, although scores worked on it for years, and the best experts of Hartford declare it a wonderful mechanism, enabling machines to turn out more work than now, the increased efficiency often rating as high as 50 per cent. The principle in itself is astonishingly simple, consisting of an eccentric disk and two sets of toggle levers in peculiar combination. As far as plans for its adaptation have developed till now it can be applied with admirable results to bicycles, automobiles, street cars, all kinds of machine tools, wind mills, hoisting machinery, etc. In automobiles it will completely displace all the present troublesome speed-changing gears.

The bicycle shows its value most clearly, as such a wheel will adapt itself to any grade or wind resistance, always giving you the right gear, say between 40 and 120, without your changing your foot pressure or the speed of the crank revolutions. This invention, which is practically of unlimited prospects, is named after its inventor, the Dieterich gear, and we shall doubtless hear more of it soon.—*Hartford Daily Times*.

THE MOTOR VEHICLE SHOW, ISLINGTON, ENGLAND.

FOR a week (ending April 21) the exhibition of motor vehicles attracted many visitors, a considerable number of whom seemed to be prospective buyers or users of such vehicles, of which there were over a hundred shown and tested, as far as the space would admit in the arena of the hall.

Petroleum seems to be the generating agent used most for carriages of the private stamp, electricity for tricycles.

The Motor Manufacturing Co. and the Daimler Motor Co. took the lead in placing a variety of petro motors on the show ground.

There was a large display of voitures for two riders. The "Triumph" and a De Dion car had seats for three or four riders.

The make-up of these vehicles was mostly by engineering firms, who supply the motor gearing and wheels, to which coachmakers put the seats and bodies; but the alliance of trades has not yet resulted in any attractive vehicles.

The art of hanging carriages is not well understood by engineers, and, judging by the drawings of the arts and science classes at Polytechnics, is almost as little understood by the present generation of embryo coachmakers. "What does it matter about the look of a motor car?" observed a stand keeper. "A few miles' ride on a wet or dusty road makes all look like a bit of the road dug up and rolled along."

The pneumatic tires used by some makers cause more dust and mud to rise than solid rubber or steel tires. The steel tires seem likely to be the eventual wheel rim guard of the best work. The springs, now so badly adjusted, may have better development than at present on motors. One coach making firm showed a body in the varnished wood. Paint would have hidden defects. The inattention to wings and mud scrapers for wheel tires accounts for the mess riders are in in using these vehicles.

A useful exhibit, that interested throngs of visitors, was of the working sections of a Daimler motor gearing. The gentlemen salesmen—who try for customers at these shows—should drop their cigars and small talk, and profit by such an exhibit of working gear; and newspaper reporters might also be gainers, and write more sensibly of motor mechanism, if they would take the trouble to study it. *Carriage Builders' Gazette*.

"A PLEA FOR GOOD ROADS."

WE are in receipt of a pamphlet entitled "A Plea for Good Roads," being a series of addresses delivered at a meeting of the Automobile Club of America, held at the Waldorf-Astoria, on February 3, 1900. These addresses are both interesting and instructive, and their publication adds another valuable volume to good roads literature.

PHILADELPHIA CLUB ELECTS OFFICERS AND ANNOUNCES ITS PLANS.

THE recently formed Automobile Club has elected the following officers: President, Henry G. Morris; vice-presidents, Herbert Lloyd, Pedro G. Salom, J. Horace Harding; secretary and treasurer, Frank C. Lewin; governors, G. Jason Waters, Robert E. Glendinning, W. W. Gibbs, John L. Wilson, Henry G. Morris, Herbert Lloyd, Frank C. Lewin.

The plan to open an automobile stable, which was brought forward when the club was organized, is now in the hands of a committee. It was stated yesterday that the club still intends to carry out the project. There are now fifty-three persons in the city owning automobiles, which they operate for pleasure, and of these, it is stated, forty-two are members of the new club. It is intended to have stated club runs, and to fraternize with similar organizations in other cities.

AUTOMOBILE PARADE.

BRIDGEPORT, CONN., JULY 4, 1900.

THE *Evening Post* and *Morning Telegram*, of Bridgeport, Conn., are arranging for an automobile parade, to come off on July 4, and invite all manufacturers and operators to participate therein, and they hope to give a large and interesting exhibition of the latest products in electric, steam and gasoline automobiles, that will interest all present and future motor vehicle users, as well as afford a spectacular show that will serve to appropriately celebrate the day. Mr. T. E. Griffin, a pioneer chauffeur of that city, offers a handsome and costly trophy for the best decorated motor vehicle. Prominent citizens will act as judges. In line will be automobile coaches, trucks, carriages, traps and runabouts of all descriptions, giving the best exhibition of the various types of horseless carriages yet seen in this country. The parade will be headed by a platoon of bicycle police, a large escort of uniformed bicycle clubs and a military band in an automobile omnibus. In conjunction with this event the management of Pleasure Beach have arranged to give a series of motor cycle races on the cement bicycle track in the Coliseum during the afternoon of July 4, after the parade. They also announce an exhibition of motor vehicle management, and offer a valuable prize to the most competent operator. There will also be motor vehicle speed tests, the supreme event being a motor cycle paced matched race.

CENTURY AUTOMOBILES.

THE Century Motor Vehicle Co., of Syracuse, N. Y., manufacturers of electric, steam or gasoline automobiles, have issued a neatly illustrated catalogue showing styles and giving descriptions of their line of vehicles. Parties interested in this line of work will do well to write the company for one of their catalogues.

INTERNATIONAL AUTOMOBILE RACE.

THE *Herald's* European editions of May 3 and 25 publish the following:

The sport committee of the Automobile Club de France met yesterday, which tends to prove that it has not abandoned all hope of continuing automobilism as a sport.

It sent out a request to the various clubs which have entered for the international cup to send in the names of their delegates.

Comte de Chasseloup-Laubat was appointed delegates of the Automobile Club de France.

The following colors have been adopted for the various vehicles: Blue for France, white for Germany, red for America, and yellow for Belgium.

MM. Giraud, Georges Huillier and Loysel were elected members of the sport committee.

It was further decided that vehicles taking part in the Course de l'Eventail—if it takes place—will have to be driven or accompanied by a member of the Automobile Club or of a corresponding club, and that the entries should bear the name of the competitor and not that of the builder of the automobile.

The Minister of the Interior on May 25 received the Comte de Chasseloup-Laubat and MM. Jeantaud and Ravenez, who went to have the conference with him in regard to the international automobile cup race and the Course de l'Eventail.

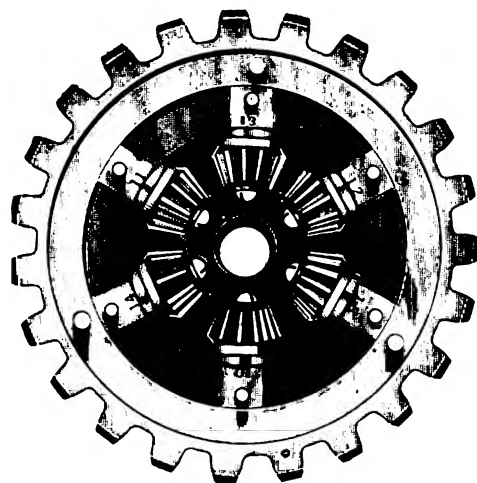
M. Waldeck-Rousseau assured them that these races would be authorized.

In consequence the sport committee of the Automobile Club of France began the organization of the international cup race, which has been fixed for June 14.

So far as announced at present, the entries for the international automobile cup race include three Belgians, one German, Mr. Winton, representing the United States, and MM. Rene de Knyff, Charon and Girardot, representing France. Owing to the recent prohibitory edicts in regard to automobile road races in France some fears had been felt as to the possibility of holding the international contest, as intended, but these are definitely set at rest by the foregoing special cable despatch to the *Herald*.

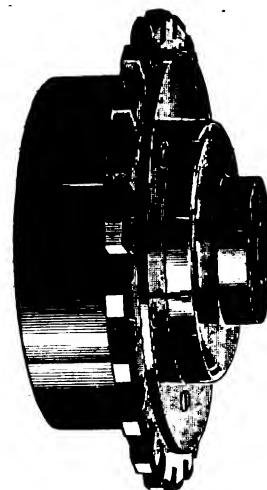
COMPENSATING GEARS.

OUR illustrations represent two views of the "Boston" compensating bevel gears, manufactured by the Boston Gear Works, Boston, Mass. These gears are now being used on motor vehicles throughout



COMPENSATING GEAR.

the United States, and have been found to be a successful mechanism for the purposes desired. It is claimed that by the use of these gears the vehicles will run more steadily than otherwise, owing to the fewer shocks and resistances offered to the rubber tires, motor engine and transmission gearing when obstacles are encountered by one or both of the wheels of the driven axle. On account of the



peculiar compensating adjustment to the slightest resistance offered, steadiness is maintained, and hence greater ease and comfort to the occupants of the carriage is assured. The manufacturers would be pleased to correspond with parties interested in gears, as they believe that they have a gear of great value. Write them for further information.

THE CREST MANUFACTURING CO.

THE Crest Manufacturing Co., the well known manufacturers of Crest gasoline motors for automobiles and tricycles, announce the removal of their Dorchester office to No. 83 Portland street, corner of Broadway, Cambridgeport, Mass., next to their factory and will be glad to welcome their customers and friends at the new location. This company is well known among carriage manufacturers, in connection with their Duplex gasoline carriage motor, which has had a large sale since its introduction in the market, as it is giving excellent satisfaction on account of its light weight per horse power and its reliability. They have catered particularly to the wants of the small carriage builder who desires to enter the automobile field. They willingly furnish blue prints and data to enable a builder of small means to build a successful motor carriage without the necessity of unsatisfactory and expensive experiments. They manufacture motors only, and do not make automobiles. At the present time they are busy, shipping on an average one motor per day.

THREE HORSE-POWER ASTER MOTOR.

THIS motor is suitable for small carriages, voiturettes, runabouts, small delivery wagons, and in fact for a vehicle of any kind for which a three horse-power petrol motor is desired. It is especially desirable for a delivery wagon or other vehicle for which a low speed is desired, as an air cooling motor of this power cannot be run at a very low speed without overheating. This motor, although a new addition to the Aster family, has earned considerable reputa-



THREE HORSE-POWER MOTOR.

tion for itself in winning a number of races this season. In the first race in Paris this season, on the 18th of February, voiturettes fitted with this motor won the first three prizes—Mercier first, Mourier second and Demester third. On March 31 Van Berendonek won the mile race at Nice, and in the hill-climbing race at Esterel, on April 1, Von Berendonek also won the first prize with his voiturette fitted with the Aster. Write the Waltham Manufacturing Co., Waltham, Mass.

TOOLS AND SUPPLIES.

THE Frasse Co., No. 38 Cortlandt street, New York, who are foremost in the machinists' tool line, have handed us a catalogue embracing foot and steam power lathes. There are a number of classes. Some are for turning and for polishing, and others for screw cutting and for boring. This list also embraces the necessary tools and appliances required with such lathes. We call particular attention to a practical milling attachment which can be fitted to any lathe, either screw cutting or ordinary speed pattern, and will do a variety of work where a planer or shaper is ordinarily employed. Anyone interested in making model engines or boilers for automobiles or auto cycles can find much useful information in this list. The Frasse Co. will be glad to mail a copy of the 1842 list to anyone mentioning **THE HUB**.

Items of Interest.

CITY OF CORTLAND, N. Y.

WE are in receipt of a profusely illustrated and finely printed pamphlet entitled "City of Cortland, N. Y." It is a 7 x 10 volume of 234 pages, and is written and illustrated in a manner that makes it interesting to the general reader, and specially so to the residents of that thriving little city. Among them interesting descriptions are given of the various plants connected with the carriage and wagon industries, as follows:

The Ellis Omnibus & Cab's Co.'s large plant is shown by a bird's-eye view, and a brief account of its history is given, together with a portrait of Mr. E. E. Ellis, and a half-tone print of his residence.

A similar exterior view is shown of the H. M. Whitney Wagon Co.'s works, together with three interiors, repository, offices and president's office, also portraits of H. M. Whitney, president, and E. S. Burrows, secretary and treasurer.

The Cortland Wagon Co.'s great plant is illustrated by a full page bird's-eye view, and an interior view of the office and four interiors of their repository, also portraits of L. J. Fitzgerald, president, and Hugh Duffey, vice-president of the company; also the residences of the two gentlemen, accompanied by a very complete sketch of the history of the company.

Another view is of the plant of the Cortland Carriage Goods Co., together with an interesting account of its growth, and the men who made it.

A portrait and a sketch of the life of the late Shepard W. Cately, of the firm of Cately & Ettling, is given, also a portrait and sketch of the business career of Mrs. Alice M. Ettling, who now has sole control of the business, also a half-tone illustration of Mrs. Ettling's residence.

A short sketch of the Cortland Buggy Co., together with a half-tone print of one of the company's bike wagons, and a portrait of J. H. Talmadge, general manager of the company.

We miss the names of several other plants, and regret their absence, as without them the extent of the vehicle and accessory industries of the city is not given.

BECKERT'S COMBINED JACK AND TRUCK.

UNDER ordinary circumstances the handling of vehicles in the workshop is inconvenient and laborious, and it is surprising what makeshifts are resorted to, all of which at the best are insufficient. Beckert's combined jack and truck fills all the requirements. It can be adjusted to accommodate any form of vehicle, and can be moved into a small space, as the rollers are on the principle of the chair caster. It is admirably adapted to the handling of automobile bodies, as with it the workman can work underneath as well as all around them, when attaching and adjusting machinery. It is equally convenient in the wood, smith, paint and trimming departments. The manufacturer's address is William Beckert, Allegheny, Pa.

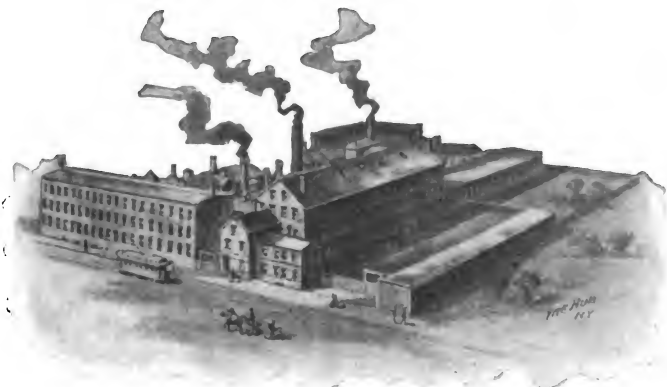
WOODWORKING MACHINERY CATALOGUE.

J. A. FAY & Co., of Nos. 531 to 551 West Front street, Cincinnati, O., the largest manufacturers of woodworking machinery in the world, have just issued a very handsome and complete illustrated catalogue of 394 pages, showing the different machines they make, and will be pleased to forward a copy to any manufacturer or foreman who is interested in that class of machinery and will write them. A large number of the machines described have been patented in 1900, and embody the latest designs and inventions in the wood-working machinery industry, which enable this firm, combined with their experience of almost three-quarters of a century, to so easily maintain their advanced position. No less than twenty-eight machines have been protected by letters patent since January 1, 1900, to say nothing of a large number issued in the latter part of 1899, some as recently as December 19. The large technical department employed by this enterprising firm and presided over by Thomas P. Egan, the president, is in the main responsible for this great number of improvements.

VALUABLE MANUFACTURING PROPERTY FOR SALE.

THE plant of the Florence Machine Co., situated in Florence, a part of the city of Northampton, Mass., buildings and about four acres of land, 416 feet facing on Main street, electric cars passing the door every five minutes; 330 feet facing on Chestnut street, 231 feet on Centre street, is offered for sale. The property is particularly well adapted to the manufacture of automobiles, being complete in every department necessary to that business.

The old factory, one portion 30 x 48, two stories high; one portion 25 x 113, two stories high, with a loft over the whole. Grinding



FLORENCE MACHINE CO.'S PLANT.

and japanning building, 39 x 75, one story high. In this building are three large japan ovens, two of them being 12 x 7 ft., one of them 10 x 8 ft., all 7 ft. high. West L, 29 x 67, two stories and loft, containing engine room on the lower floor, nickel plating department on the upper floor. Boiler house, 24 x 60, one story. Pattern shop, 30 x 60, two stories, lower story being used for storage of coal and coke, and is connected with boiler house. Store house for patterns, 20 x 63, one story, with loft. Annealing room, 25 x 30. Blacksmith shop, 30 x 40. Tumbling room, 30 x 43. Fan room, 17 x 30. Foundry, 40 feet wide, 84 feet on Chestnut street, 44 feet on Centre street. Core room and flask room, 40 x 54. Wood pattern shop, 20 x 32. Building No. 1, three stories, with basement and attic, 35 x 159. Extension to No. 1, one story high, 35 x 159. Office building, two stories and basement and loft, 20 x 52. Wood mill, 154 x 40, three stories and basement. Foundry equipped with six ton modern cupola and two brass furnaces.

Office building, wood mill, old factory building, west L, grinding and japanning building, blacksmith shop, tumbling and fan rooms, together with foundry, No. 1 building and No. 1 extension, are all of brick. Wood mill, old factory building, japanning and grinding building and west L are all equipped with Grinnell's automatic sprinklers. No. 1 building, No. 1 extension, foundry, annealing room, blacksmith shop, tumbling room and fan room are equipped with stand pipes and concealed pipes in the loft.

This sprinkling service and the water supply for the entire shop are taken from three separate supplies from the street main, through 4 in. pipes. The sprinkling service is also connected with a Gardner Governor Co.'s Underwriter fire pump, with 8 in. suction, 4 ft. lift, capacity of 500 gallons per minute, also connected with a cistern in the yard with a capacity of 22,900 gallons. There are five private fire hydrants for regular fire service hose inside the yard, one city hydrant in front of the wood mill on Main street, directly connected with 16 foot main. There is a second hydrant opposite the foundry on Chestnut street, connected with 6 in. street main, and another hydrant opposite the No. 1 extension on Centre street, directly connected with 6 in. street main.

All the buildings are very substantially constructed and heavily timbered. Are in good condition and repair. Roofs are either of slate, gravel, tin or asphalt. Pattern shop is of wood, with a tin roof. Store house for patterns is of wood, roof and sides being of corrugated steel. There is also connected with the foundry a large shed, 25 x 89, for storage of flasks, one story high, built of wood. Core building and wood pattern shop are of wood, with roof and siding of corrugated steel. There is also, inside the yard, a one story wood shed for the storage of lumber, 27 x 107, with gravel roof.

Buildings contain over 100,000 feet of floor space, and there is vacant land sufficient to increase this to twice the present capacity.

Power is steam, generated by one 110 horse tubular boiler, built by the Whittier Machine Co., of Boston. Engine, Corliss, 14½ in.

cylinder, 36 in. stroke. Will generate 110 horse power with 100 pounds steam pressure. The entire plant, except foundry, is heated by steam, using Warren Webster vacuum system throughout. Entire plant is lighted by electricity, generated by an Elektron 400 light, 16 candle power, 110 volt dynamo.

Nearest steam fire engine and hose carriage less than 1,000 feet distant. N. Y., N. H. & H. R. R. station within two minutes' of the factory. Boston freight on all materials.

Taxes and water rate less than \$800 per year. Insurance 85-100 of 1 per cent.

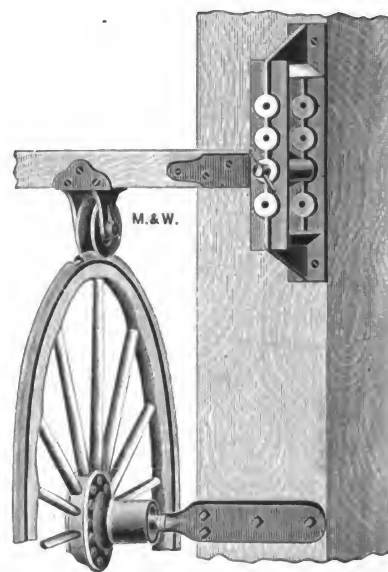
The foundry, nickel plating and polishing departments and wood working department are now being profitably operated. Arrangements could be made for turning over the plant immediately. No. 1 building and No. 1 extension are idle and vacant, and machinery could be set in at a moment's notice.

The situation is most excellent for business, being in a very healthful and quiet community. Educational opportunities unsurpassed, and from the fact that there are near by a large number of first class mechanics and that there never has been, in the history of the plant, any labor troubles or disturbances of any kind, makes it a most desirable plant for a large manufacturing concern to locate.

A very low price will be made on the entire property. For particulars, terms and full information, write Florence Machine Co., Florence, Mass.

RUBBER TIRE END ADJUSTER.

In order to facilitate the bringing of the ends of vehicle tires together after they have been fastened in the channel and riveted, Morgan & Wright are manufacturing a little tool for this purpose, which they are now furnishing the trade. As shown in the accompanying cut, this tool consists of a small grooved wheel attached to a lever, this lever being four feet in length, thus giving plenty of leverage. (Only part of lever is shown in cut.) This lever is fastened to an iron frame with four sets of holes to make it adjustable to any size wheel. The method of bringing tire ends together is very simple. Place the wheel on the axle fastened to a beam, as



RUBBER TIRE END ADJUSTER.

shown in cut. Adjust the lever to the diameter of wheel. The grooved wheel is then placed on the tire opposite the opening, and while an assistant bears down on the lever, turn the wheel half a turn each way, which will bring the ends of the tire together, when the rubber solution will soon form a perfect union and a continuous tire. The ends of a tire can be brought together in thirty seconds by use of this little tool.

C. SCHRACK & CO.

THE firm of C. Schrack & Co., composed of Joseph Stulb, Sr., Townsend Willits, Edwin H. Stulb and Joseph Stulb, Jr., varnish manufacturers, of Philadelphia, Pa., has been dissolved, and the interests of Joseph Stulb, Sr., and Townsend Willits have been purchased by Edwin H. Stulb and Joseph Stulb, Jr., who will continue the business under the same firm name of C. Schrack & Co., at 152 North Fourth street, Philadelphia, and in Camden, N. J.

THE GARVIN MACHINE CO.

EACH year brings an increased demand for machinery for the carriage and automobile trade, the latter especially, as so large a part of the gear is of metal, and in addition there is the motor gearing, no matter whether the power be electric, hydrocarbon or steam.



The manufacture of labor-saving machinery has progressed so rapidly that what was best of five years ago is obsolete now, and machine manufacturers find it necessary to meet demands for improved machines for old as well as new purposes. Among the companies that recognize this fact is the Garvin Machine Co., of New York City, and we recommend all who are interested in iron working machinery to correspond with the company and procure one of their illustrated catalogues, which will be sent on receipt of request.

A NEW COMPANY.

THE Hickory Carriage Co., of Cincinnati, has opened a factory for the purpose of manufacturing moderate-priced buggies, carriages, phaetons, etc. The manufacturing department will be under the management of James R. Anderson, formerly of the Anderson-Harris Carriage Co., of Cincinnati, and Elmwood Place, who has been long and favorably known as one of the leading manufacturers in this great industry. Mr. Anderson has made the building of carriages and buggies a life-long study, is an acknowledged master of the art, and with his years of experience and an able corps of assistants the company hope to produce a vehicle that for style, durability and beauty of finish cannot be surpassed. Their facilities will be the best, modern and up to date. Their plant is one of the most complete and best equipped in the center of the vehicle manufacturing interest of the world, where shipping facilities are the best, where the best material used in the construction of vehicles can be purchased the cheapest, where the best skilled labor can be secured. The company's motto is "Honest work and fair prices."

BORAX.

IN the United States the annual consumption of borax is about 12,000 tons. Prior to 1864 consumers were dependent upon Europe for their supplies. In that year the deposits in California, which were discovered in 1856, yielded 24,304 pounds, which sold at 39 cents a pound. With the increased production prices declined somewhat, so that in 1872, the year the Nevada deposits were discovered, prices had fallen to 32 cents. The production for that year was 280,000 pounds. In 1873 supplies from Nevada and from the new San Bernardino County deposits, recently discovered, brought production up to 2,000,000 pounds, causing prices to decline to 24 4-5 cents. The succeeding year the production was doubled, with prices declining to 14 1-5 cents. From that year to the present production has steadily increased, with some interruptions, until the maximum of 1899 has been reached, with prices 7 cents a pound. The lowest price ever known was in 1887, when borax sold at 5 3/4 cents. The

Dingley tariff not only cut off foreign importation, but raised the price of the native product from one to one-half cent a pound.

The high price prevailing in 1872 stimulated the search for new deposits, and, in that year, Teels borax marsh, near Columbus, Nev., together with Rhodes, Columbus and Fish Lakes, all in the immediate neighborhood, were located and promptly developed. The supply was largely increased from these fields. In 1880 the largest deposits of all were discovered in the lowest depression of Death Valley. The Amargosa borax deposits, with the Monte Blanco borate mine of this section, are of enormous extent, and fully capable of supplying the world for an indefinite time. These mines are located in a region the most forbidding, remote from the railroad, and offering almost unsurmountable difficulties in the reduction and marketing of their product, but their richness and extent, compared to all other fields, soon caused them to be regarded as the principal source of supply for the future production of borax in the United States.—*Scientific American*.

PATTERN LETTERS.

EVERY worker in brass or iron castings knows the value of letters for patterns. A. G. Butler, of 101 Beekman street, New York City, manufactures these in a great variety of styles and sizes, ready for attaching to the patterns. These letters being made by an expert and for the specific use, are correctly constructed, and give no trouble to the moulder. Mr. Butler makes another article that is of special value to manufacturers who have wood cuts and electrotypes of their product, whether for advertising or for catalogues. These cabinets are made with drawers of sufficient depth to receive a cut without danger of same being marred when pulling out the drawer. The losses now occasioned by damage to cuts is great, as all who have them know, all of which could be saved with cabinets in which



PATTERN LETTERS.

ELECTROTYPE AND WOOD CUT CABINET.

to store them. THE HUB's advice to all who want pattern letters, as well as places for storing their wood cuts and electrotypes, is to write to Mr. Butler. See advertisement on another page.

LARGE FIRE IN GREENWICH, CONN.

ONE of the most disastrous fires to the carriage industry was the destruction of the large carriage repository of John H. Ray & Son, Greenwich, Conn., on the evening of May 16. It was occasioned by the upsetting of a lamp in the cellar, and spread so rapidly that it was impossible to save any of the contents of the building. The Messrs. Ray had one of the most complete repositories in the country, and the largest in the State of Connecticut, the building being 85 x 200 feet. They carried about 300 vehicles, very many of them being of the highest grade, and in addition a large stock of hardware, paints and oils. The loss on building and stock approximate \$120,000. The insurance was \$15,000 on the building and \$5,000 on the stock. Notwithstanding the heavy loss the firm are in no wise discouraged. Their financial situation is such that they can bear the loss, although heavy, and will immediately begin work on a new repository, and will resume the carriage end of their business in the shortest time possible, and Ray's carriage repository will soon again be one of the leading features of Greenwich. The company has leased the opera house, and will open a repository, and will fill it with a full line of vehicles as quickly as possible.

CREDIT IS GOVERNMENT.

"ONLY those have a right to govern who can foresee," said Emile Zola, criticising the French government in the Dreyfus case. The credit men who "foresee" and therefore "govern" the action of their debtor, are those who interchange with each other the facts contained in their ledgers. Bankers and credit men can furnish information so accurate that failures will cease, except those due to fire, flood or famine—unforeseeable disasters. A failure outside the exceptions noted above can only occur in one of two ways: First, and most frequent, is the gradual decline due to incompetency, dry rot, changed trade conditions (which the insolvent fails to note) or old established enterprises passing into the hands of a new set of men, the genius who established the firm being gone, as in the case of A. T. Stewart & Co.

The weakness in a firm due to any of the above causes will always be revealed at the very beginning in one of two ways. If the disbursements in the conduct of the business exceed the receipts and the payments for merchandise are met promptly it can only be done by increasing loans at bank. If borrowing is not resorted to, the firm must become slow in meeting merchandise accounts. This being true, the only possible protection to bank and merchandise creditors is to exchange the facts in their respective ledgers, and when an unfavorable condition is thus revealed all intelligent creditors should decline to extend further credit until the cause of weakness, whatever it may be, is fully uncovered and removed.

When a failure occurs, whether it be voluntary or involuntary, under present conditions, creditors only interchange their ledger facts when one or more have taken some legal step, which, being given publicity, awakens all other creditors to the necessity of doing something to protect their interests; then they interchange their ledger facts by joining in the bankruptcy proceedings, usually at a great loss compared to what they might have saved had they revealed the facts to each other before the collapse, instead of after.

The second cause of failures is through the efforts of dishonest men to swindle creditors by securing all the money and merchandise for which they can get credit. Such failures are always preceded by an increase of loans or purchases of merchandise, or both. To avoid being victimized by such efforts all that is necessary for creditors to do is to exchange the facts with each other as to the amounts of loans applied for, merchandise ordered, or both; when such amounts are excessive, compared with previous transactions, few will be so unwise as to risk any credit.

The remedy is so simple and easy of accomplishment that it is difficult to understand why so many bankers and credit men continue to isolate themselves from their fellow men, to their great financial loss. It is a subject that is of the most profound importance at the present time, owing to the tremendous expansion of credits that has been going on for three years, and which will be continually enhanced during the next two by the increase of bank currency which will seek investment. We do not wish to pose as alarmists, but unless the credit givers of the United States adopt a better method than that now in general use for obtaining facts upon which to base credits, the next panic (which will not be so long in coming as the previous one) will be the most disastrous the world has ever known.

The several failures recently of large concerns revealed the ease with which paper is floated among banks at present if the maker possesses an ancient name. If one will look about him and realize the number of concerns doing apparently as those who failed were doing, the question will readily occur, How many of these are in the same condition? If the ledger facts were put through a "clearing house" it would reveal a large number. There is much talk by bankers and credit men when in convention about insisting upon signed statements as a basis for credit, the demand for better mercantile agency service, the effort to procure more stringent laws for the protection of creditors, etc., whereas, as stated in the beginning of this article, they have in their possession the "knowledge" which gives the "power" to govern, and they need neither debtor's statement, the law's strong arm, attorney, judge or jury, but simply to "get together."—*The American Banker*.

CARRIAGE MAKERS' OFFICERS.

At the last annual meeting of the J. M. Quinby Carriagemakers' Mutual Benefit Association, held in Fergg's Hall, Newark, N. J., the following officers were elected for the year: President, A. L.

Ryno; vice-president, John Robertson; secretary and treasurer, John Miller, Jr.; sergeant-at-arms, — Wilderman; executive committee, James Huhn, Francis Titus, Anthony Shaffer, Frederick Schumacher and Charles La Rue. The annual family picnic of the association will be held in Seifert's Park, on Saturday afternoon and evening, August 11. The arrangements for it are in charge of Frederick Schumacher, George Jacobus, Christian Trautwein, Donald McCoy, John Robertson, Anthony Shaffer and John Miller, Jr.

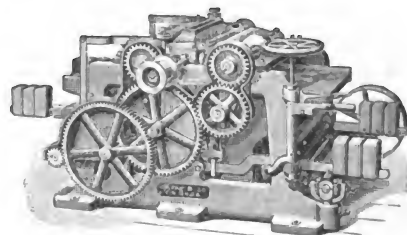
BUYING IN THE WHITE.

IN recalling the old saying that "Fortune knocks once at every man's door," it would certainly seem that the elusive dame is just now in great danger of wearing out her knuckles on the doors of the carriage men of the country. With the advent of prosperity comes the desire of our people to enjoy themselves in every possible way. Hardly any more delightful pleasure exists than that afforded by a high-spirited horse and a good carriage. Here is where the carriage man comes in with his opportunity to administer to the great mass of pleasure loving people. If lacking in the facilities for running a profitable carriage business, he can overcome the deficiencies by buying the right kind of work in the white. This will enable him to accomplish the purpose for which he is in business in the shortest possible time. Work can be bought in the white in quantities and at times to suit the convenience of the purchaser. If his credit is good he can buy say 100 jobs, give his note for them, and all the cash he invests is the money he pays for freight, and finishing up. If he is a good, bright, hustling fellow he can finish and sell the entire 100 jobs within three months, and quickly clean up perhaps \$2,500. In a word, the rapidity with which money can be made is limited only by the facilities for painting, trimming and the ability to get orders. If he wishes to avoid the detail and worry of a large number of different styles going through the factory at the same time, the carriage man can cut out many of the styles, and thus give more time to advertising and selling. As the invoices show the actual cost of the work there should be none of the losses which occur from mistakes in charges, owing to inability to properly estimate the cost. The carriage man who buys in the white will know just how much to charge and just how much he is making.

Among the first concerns to place unpainted work on the market was the Buffalo Spring & Gear Co., of Buffalo, N. Y. Owing to exceptionally progressive methods of manufacturing the Buffalo Co. claim to sell in the white as low, if not lower, than it costs others to build from the plank. Thus it would seem that if carriage men could only appreciate the economic and satisfactory conditions of buying in the white they would order a part, at least, of their work in this shape. Life, at best, is short; and if as much money can be made in one way as another, let us by all means go about it in the easiest way.

SINGLE CYLINDER CABINET SMOOTHING PLANER.

WE illustrate a new machine just placed on the market by J. A. Fay & Co., of Nos. 531 to 551 West Front street, Cincinnati, O., and patented February 6, 1900. It is their new No. 19 single cylinder cabinet smoothing planer. The more noticeable mechanical advantages in this machine are: First, the feed rolls are center-gear and hung pivotly; second, the pressure for each roll is



SINGLE CYLINDER SMOOTHING PLANER.

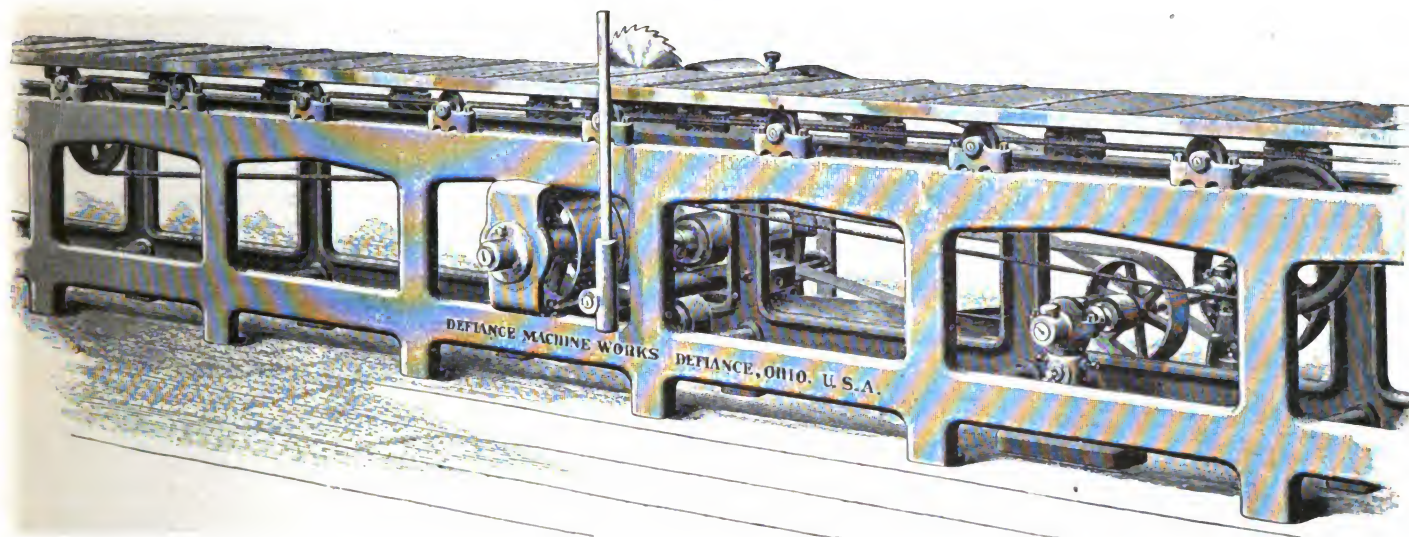
cushioned on a spring, giving great advantage in a very fine cut, and enabling the operator to plane smooth without wave; third, the bed raises and lowers on long inclines; fourth, the feed is so arranged that with one lever its speed can be increased or reduced, started or stopped, instantly. The manufacturers will be pleased to furnish any of our readers, who may be interested, and will write them, prices and full particulars of this or any other machine for working or cutting wood.

POWER FEED TRAVELING CARRIAGE EDGER.

THE engraving herewith illustrates a No. 4 power feed traveling carriage edger, constructed on a substantial iron frame; especially designed for edging lumber, sawing wagon and carriage poles, rim strips and other similar work from the plank. The material can be placed on the table and sawed either parallel or tapering. It is usually built to cut material up to 20 feet in length. It can be furnished when so ordered to special lengths, either shorter or longer.

MERRIMAC.

THE Haverhill (Mass.) *Gazette* says: "With the cry of dull times coming from the nearby field of Haverhill's shoe industry, it is a very pleasing contrast for the Merrimac carriage manufacturers to contemplate the flourishing conditions of their own line of trade. From the local point of view the carriage business is decidedly encouraging. One man, who is immediately associated with one of the leading Merrimac firms, stated to-day that the trade was better,



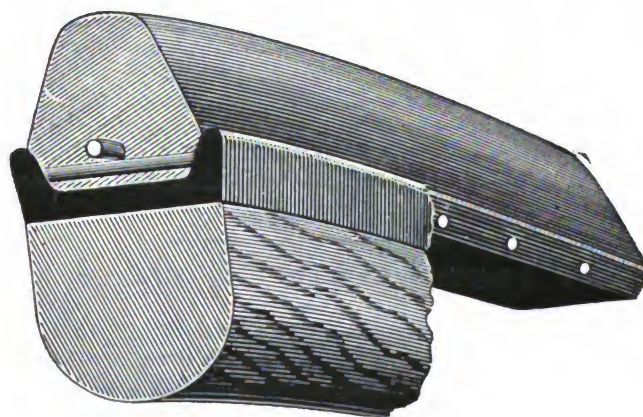
POWER FEED TRAVELING CARRIAGE EDGER.

The frame is of iron throughout, and it is heavy and substantial to stand the rapid work expected of it. The top is planed true to receive and keep the friction rolls, upon which the table rides, in perfect alignment. One row of the friction rolls have plain straight faces; the other is provided with grooves, and they are all fitted to steel spindles with reamed holes. The table is built of hard wood strips bolted together and faced with steel plates on top to prevent wearing. The track on the bottom side of the table is planed true to accurately fit the faces of the friction rolls. The friction feed for operating the table is very powerful and noiseless in its operation, and it is of the most rapid and positive kind. The table feeds forward at the rate of 180 feet per minute, with a quick return movement of 700 feet per minute. It can be started in either direction instantly, or stopped by a slight movement of the vertical lever. Safety stops are fitted to each end of the table to automatically disengage the feed when the end of stroke is reached. The saw arbor, of steel, large in diameter, is provided with three long self-oiling connected bearings, with a driving pulley between them. This machine is manufactured by the Defiance Machine Works, Defiance, O., U. S. A.

for this time of year, than it had been for several seasons. The orders for lighter vehicles to supply the summer trade have been coming in steadily, and practically every shop is rushed. Briefly, 'It beats all how business keeps up.' A workingman expressed his view of the matter this afternoon in the words: 'No carriage workman needs to loaf in Merrimac.' One of the manufacturers has a placard displayed in the post office, indicating that trimmers are wanted at his shop, and this general need of more help is acknowledged by all."

"WEMAKA" RUBBER TIRE.

THE "Wemaka" tire is another of the competitors for the rubber tire trade. This tire is constructed with a view to overcoming defects existing in solid rubber tires, and its manufacturers claim for it



"WEMAKA" RUBBER TIRE.

a front place in the rubber tire rank. The description of this tire that appears in their advertisement this month should be read by all who are interested in rubber tires. The manufacturers are the "Wemaka" Rubber Tire Co., of Chicago, Ill.

A PROGRESSIVE WHEEL MANUFACTURER.

WILLIAM W. BOOB, of Center Hall, Pa., though carrying on business in a small inland town, has pushed his business until he is among the best-known of wheel manufacturers. He has his plant fitted up with modern machinery, and furnishes wheels with or without tires, rubber or steel; in fact, he can furnish any kind of wheel, in whatever condition the buyer may want.

PROTEST FROM CINCINNATI.

GENTLEMEN—On March 31, we sent you a communication as to the advisability of holding an exhibition of carriages, harness and implements during the month of November.

The companies whose names are hereto attached have decided they will not make an exhibit at Music Hall, in Cincinnati, during the last half of November.

Yours truly,

SECHLER & Co.	OHIO VALLEY BUGGY Co.
RATTERMAN & LUTH.	EAGLE CARRIAGE Co.
THE EMERSON & FISHER Co.	THE PERKINS-CAMPBELL Co.
THE HAYDOCK CARRIAGE Co.	THE ENTERPRISE CARRIAGE MANUFACTURING Co.
ANCHOR BUGGY Co.	THE KEYSTONE CARRIAGE Co.
BRIGHTON BUGGY Co.	PHOENIX CARRIAGE WORKS.
BROWN CARRIAGE Co.	FISHER CARRIAGE Co.
THE JAMES & MAYER BUGGY Co.	BUOB & SCHEU.
SAYERS & SCOVILL.	THE ENGELKE SADDLERY Co.
THE ACORN BUGGY Co.	FRANK J. ENGER.
ADVANCE CARRIAGE Co.	GROSSMAN, SCHLEUTKER & Co.
COLUMBIA CARRIAGE Co.	VEERKAMP BUGGY Co.
JEWELL CARRIAGE Co.	CONTINENTAL CARRIAGE Co.
LION BUGGY Co.	VICTOR BUGGY Co.

EXPIRED PATENTS.

THE following list of recently expired and issued patents is furnished by Messrs. Davis & Davis, successors to Alexander & Davis, solicitors of patents, Washington, D. C. A copy of any one of these may be had for 10 cents by sending to the above firm.

EXPIRED MARCH 6, 1900.

- 273,289—Side-spring Vehicle—Joseph Kengle, Detroit, Mich.
 273,372—Whiffletree—Frederic Lifflefield, Gardiner, Me.
 273,427—Fifth Wheel for Vehicles—James Allen, Alliston, Ont., Canada.
 273,449—Vehicle-spring—William Boughton, Caledonia, O.
 273,463—Axle-box—Robert Cartwright, Rochester, N. Y.
 273,497—Thill-coupling—Thomas Ferguson and Charles L. Ferguson, Toronto, Ont., Canada.
 273,548—Wheel-hub—Moses C. Johnson, Hartford, Conn., assignor to himself and William N. Woodruff, same place.
 273,553—Carriage Pole—Mortimer D. Lawrence, Marshalltown, Ia., assignor to himself and Pliny T. Birchard, same place.
 273,580—Tire-upsetter—Levi K. Miller, Collamer, Pa.
 273,618—Vehicle-hub and Axle—George H. Simmons, Taunton, Mass.

EXPIRED MARCH 13, 1900.

- 273,745—Carriage-curtain Fastening—William Leggett, New York, N. Y., assignor to James N. Bookstaver, Rutherford, N. J.
 273,746—Wheel—James R. Little, Quincy, Ill., assignor of three-fourths to Cylon Smith, Thomas Hill, and Pliny Bliss Williams, same place.
 273,766—Carriage-top—William B. Sales, Fort Atkinson, Wis.
 273,804—Two-wheeled Vehicle—John A. Bilz, Pleasanton, Cal.
 273,808—Thill-coupling—Calvin A. Buffington, Berkshire, N. Y.
 273,832—Sand-band for Vehicles—Willis M. Farr, Dowagiac, Mich.
 273,877—Thill-supporter—Edgar H. Morgan and Charles Morgan, Freeport, Ill., assignors to Michael Lawyer, Antoinette Morgan and Alice Morgan, all of the same place.
 273,967—Wagon-body—Chauncey M. Coutant and Richard Benson, Crawfordsville, Ind.
 274,098—Vehicle-spring—William H. Tarbell, Lansingburg, N. Y.

EXPIRED MARCH 20, 1900.

- 274,131—Carriage-seat—Frank D. McDowell, Clinton, Ia.
 274,136—Hub-band—Abijah S. Parker, Cincinnati, O.
 274,137—Carriage-curtain Knob-patch Fastener—Abijah S. Parker, Cincinnati, O.
 274,167—Sulky—Theodore Boettcher, Mendota, Ill.
 274,168—Tire-setter—Henry D. Bokop, Defiance, O., assignor to himself and D. B. Turnbull, same place.
 274,147—Shifting Rail—O. Chester Coggins, New Haven, Conn.
 274,179—Tire Tightener—Jessie B. Cypert, Waynesborough, Tenn.
 274,183—Two-wheeled Vehicle—George W. Dutton, Tomales, Cal., assignor of two-thirds to Louis Guldayer and M. L. Murphy, same place.
 274,199—Whip-socket—Philip Jasnowski, Detroit, Mich.
 274,216—Combined Cutting, Punching and Tire-upsetting Machine—Harris Morse, Tuttle town, Cal.
 274,390—Side-spring Vehicle—Cyrus W. Saladee, Torrington, Conn.
 274,401—Two-wheeled Vehicle—George E. Spare, New Haven, Conn.
 274,412—Lamp Sign—James S. Thomas, New Orleans, La., assignor of one-half to Edward Smith, same place.

EXPIRED MARCH 27, 1900.

- 274,470—Hub Boring Machine—John T. Detterer, Willshire, O.
 274,496—Carriage-top—William Hodge, Uxbridge, Ontario, Canada.
 274,547—Vehicle-spring—Victor M. Backus, Indianapolis, Ind.
 274,636—Two-wheeled Vehicle—Roswell C. Morse, Syracuse, N. Y.
 274,722—Two-wheeled Vehicle—Ezra F. Conner, Greensburg, Ind., assignor of one-half to Oliver P. Schriver, same place.
 274,769—Vehicle-body—Frank K. Kerr and Samuel K. Kerr, Westminster, Md.

EXPIRED APRIL 3, 1900.

- 275,084—Two-wheeled Vehicle—Hiram T. Seeley, Sheboygan Falls, Wis.
 275,120—Vehicle Wheel—Ludwig Bernet and Frank Bernet, Bingen, Germany.
 275,133—Two-wheeled Vehicle—Adam Burkhard, Philadelphia, Pa.
 275,143—Sulky—David E. Chandler and Jay C. Williams, Aurora, Ill., assignors of one-half to Lucius W. Blakesley and Frank J. Randall, same place.
 275,147—Platform Gear for Wagons—David Clark, New York, N. Y.
 275,196—Whiffletree-hook—John J. Gheen, Bridgeport, Conn.
 275,257—Dash-board for Vehicles—Wales A. Packard, Urbana, O., assignor of one-half to Wilson M. Baker, same place.

EXPIRED APRIL 10, 1900.

- 275,398—Carriage-door—Gustavus Lowa, St. Louis, Mo.
 275,400—Running-gear for Vehicles—James McLaughlin, Ovid, Mich.

- 275,439—Vehicle-spring—Irett F. Tucker, Dumner, Mich.
 275,445—Sulky-spring—Isaac A. Wesson, Wingo, Ky.
 275,446—Seat-spring for Vehicles—Jerome W. Wetmore, Erie, Pa.
 275,470—Vehicle-pole—Frederick G. Crowley, Sedalia, Mo.
 275,512—Two-wheeled Vehicle—Willis O'Brien, San Francisco, Cal.
 275,572—Spring-vehicle—Charles N. Blydenburgh, Riverhead, N. Y.
 275,714—Neck-yoke—Herschel Schermerhorn, Waterman, Ill., assignor to William L. Colton, same place, and A. L. Baker and William Egermann, Aurora, Ill.

EXPIRED APRIL 17, 1900.

- 275,865—Rub-iron for Vehicles—Dyas Shelton, Santa Rosa, Cal.
 275,868—Wagon-body—John Stevens, Wonewoc, Wis.
 275,907—Wagon-hound—Andrew J. Harper, Unionville Centre, O.
 275,965—Two-wheeled Vehicle—Harry Watts, Knightstown, Ind.
 276,011—Running-gear for Carriages—George W. Earle and George S. Strail, Tully, N. Y.

Trade News.

BY UNCLE SAM.

CALIFORNIA.

SAN FRANCISCO—The carriage shops of Atwater & Brennan were destroyed by fire on May 4.

COLORADO.

PUEBLO—It is practically a certainty that the Steel & Wagon Works will be erected in Pueblo. W. H. Schofield, of the American Steel Wheel & Wagon Co., of Elmira, N. M., has consulted with directors of the Business Men's Association and officials of the Colorado Fuel & Iron Co. with a view of completing plans for the building. Mr. Schofield said the works would without doubt come here. The plant will employ 250 to 500 men.

CONNECTICUT.

NEW HAVEN—The Brockett & Tuttle Co., carriage builders, have removed to 836 Grand avenue, in the building formerly occupied by the Manville & Dudley Co. The new location offers many advantages over the old stand. In the first place, it is more central to the trade, and the entire plant since the renovation it has received is particularly adapted to the carriage business. At their new establishment this firm will still continue to manufacture the same fine, high grade carriages that have for so many years been their chief feature.

It is understood that the firm of M. Seward & Son, the Lake place manufacturers of carriage and general hardware, have practically decided to lease part of the factory of the Mallory-Wheeler Co., on East and Greene streets. The Mallory-Wheeler Co. is using but a small portion of its large plant at the present time, and the officials of the concern have been trying to lease part of the establishment for over a year. As soon as the courts decided that the Searwards must leave Lake place or put a stop to the heavy trip-hammers, the officials of the company began to look around for a suitable site. The injunction issued by the Superior Court will go into effect the 1st of March, 1901, but there is no disposition on the part of the Searwards to wait until that time before moving into a desirable factory if one can be found. They have looked over a number of factories and sites in the city and it is understood have decided that the Mallory-Wheeler factory is the most desirable of the plants available.

ILLINOIS.

MOLINE—The Moline Wagon Co. closed down its works on May 7 for their annual inventory, which is usually taken in mid-winter, but the rush of work has been so continuous for the past eighteen months that it was impossible to take account of stock at the usual time. The shut-down is expected to last only for three to four weeks, although future business will be more or less dependent upon the caprice of the steel market. The Wagon Co. has not bid on the usual contracts this year, but has been kept unusually busy with its regular line of trade. About 350 men have been employed throughout the year.

PEORIA—The Peoria Buggy Manufacturing Co., the only buggy manufacturers in that part of the country, are doing a fine business, both with the jobbing and the retail trade. They build buggies to order, and also carry a large line of vehicles of their own make on hand for inspection.

PONTIAC—M. Dolde & Son have put in the Kelly rubber tire plant. They can put rubber tires on your buggy in a day.

PRINCETON—The Star Manufacturing Co. are sending out a folder with a large print of the Star quick shifters and anti-rattlers, and with it some pertinent questions. They will send you a card on receipt of a request for the same.

INDIANA.

INDIANAPOLIS—The opening of the H. T. Hearsey Vehicle Co. on the circle occurred on May 2, with an elegant display and a concert. A row of electric lights extended about the front of the building, and the interior was decorated with potted plants, cut flowers and hundreds of incandescent lights. The display of bicycles was especially pleasing to the hundreds of riders who passed through the building. There were also many compliments on the display of automobiles and carriages.

CORYDON—An extensive wagon factory is to be located at Corydon. The citizens of the town donated \$2,000 and a site for the factory to secure the location of the plant.

RICHMOND—The Richmond Commercial Club was successful in locating a new industry for the city on May 24. It is the Gleason carriage lamp concern, of Columbus, O. The gentlemen interested, Messrs. Miles and Gleason, of Columbus, and E. E. Perry, of Indianapolis, were here, and purchased the brick buildings until recently occupied by the Richmond Bicycle Co. They paid cash for the buildings and have come to the city without asking a bonus. Articles of incorporation under the laws of Indiana will be filed, the capital stock to be \$50,000 or more. In addition to carriage lamps the company will manufacture carriage hardware and iron and brass beds. It is the intention to employ fifty men from the start.—*Indianapolis Journal*.

STINESVILLE—A new wagon and buggy hub factory is projected here by D. E. McHenry.

TERRE HAUTE—The Terre Haute Carriage & Buggy Co. is working on an order of 100 regulation United States screen mail wagons for southern mail contractors. The wagons must be delivered on June 15, and a force of sixty men is being employed to push the work.

IOWA.

DES MOINES—The Kratzer Carriage Co. has nearly concluded arrangements for enlarging its factory by occupying the space in the building west of its factory and facing Second street, now occupied by the Bartholomew Co.

MAINE.

DEXTER—H. G. Parshley is erecting a large and roomy carriage repository at the rear of his dwelling houses on Spring street and back of the Exchange Hotel. When his present plans are carried out he will have a livery stable and a carriage house of two sections, 107 feet long and about 80 wide.

PORTLAND—The firm of F. O. Bailey & Co. threw open the doors of their new carriage emporium on the corner of Middle and Market streets, on May 28. The building is 35 feet on Middle street and 110 on Market street, and is six stories in height. The six floors contain 23,100 square feet of floor space exclusively devoted to the display of merchandise. The store is lighted by 108 windows, and 140 incandescent lights will be used to furnish artificial light whenever this is found to be necessary. There is a complete system of private telephones connecting all of the various floors, departments, office, etc. The elevator, which is also operated by electricity, runs from basement to roof and contains all of the most improved appliances for safety and convenience. The company is to be congratulated on so quickly replacing the building that was burned about four months ago, and for making their new one a model in style, finish and in convenience.

MASSACHUSETTS.

AMESBURY—Carr & Prescott, wheel manufacturers, report business as being very good. They make a fine line of wheels, both heavy and light, including wheels for pneumatic tires on runabouts, etc., also wheels for automobiles. In addition to a good local trade they are getting many orders all over the country, and also some from abroad.

It is reported that Warren Congdon, of the Connor Carriage Co., and John Little, foreman of the painting department of S. R. Bailey & Co., are to form a co-partnership for the manufacture of carriages, and are to occupy the Samuel Rowell Son's plant near the depot.

MALDEN—Newcomb Bros.' carriage factory was damaged by fire on May 9. The damage to the building is about \$700, and a stock loss of \$900, covered by insurance.

W. B. Keen & Son added a large repository to their plant this season, and report business better than ever before.

MERRIMAC—It is reported that an annex is to be built on the carriage factory of J. B. Judkins & Sons' Co.

MICHIGAN.

DOWAGIAC—Malcom Campbell and James M. Somers have bought the wagon factory of F. W. Van Antwerp, on Division street, and will run it upon a larger scale in the future.

FLINT—The J. B. Armstrong Co., manufacturers of carriage springs, have signed a contract with the Flint Factory Improvement Co. to locate their large steel plant on the lands owned by the Improvement Co. Work on the new plant will be commenced at once, and when completed will employ 300 hands the entire year.

FULTON—The Fulton Buggy Co. are now constructing their No. 10 buggy with hard rubber tires. This is in line with other im-

provements which this enterprising company is always on the alert for in relation to the popular product of their factory.

PONTIAC—The Pontiac Buggy Co. are sending out small "poster" cards calling attention to their "Western Amesbury Line," which sell easy and which they guarantee.

MINNESOTA.

WINONA—The Winona Wagon Co. recently sent a special train of eighteen cars, containing 425 wagons, valued at \$30,000, to Dallas, Tex.

ST. PAUL—Messrs. A. H. Lindeke, Lorenz Mitsch and E. J. Schurmeier have made their report to the District Court as arbitrators for the dissolution of the firm of Mahle & Sutmar. They find that the assets of the firm are \$9,183.23, and the liabilities \$3,409.04, including a note to Mahle of \$700, and an account to Nicols & Dean of \$1,008.30. Mr. Mahle will go on with the business under the title of the Mahle Wagon Co.

MISSOURI.

KANSAS CITY—Clem H. Davis and J. C. Davis, of Hartwell, formerly with the Columbia Carriage Co., of Hamilton, O., have organized the Kansas City Buggy Co. at Kansas City, Mo., with a capital stock of \$75,000. A plant with 75,000 feet of floor space will shortly be erected.

ST. LOUIS—The Piper Carriage Co., a new concern, will open a factory on the northwest corner of Seventh and Poplar streets about July 1, for the manufacture of surreys and spring wagons.

NEW JERSEY.

SOMERVILLE—The Ballantine & Van Fleet Carriage Manufacturing Co., of 200 to 210 Main street, is one of the largest firms in the State now engaged in that line. This firm has steadily grown, until it is now particularly well equipped to cater to everyone in this vicinity.

CAMDEN—At the annual meeting of the stockholders of the General Carriage Co., held on May 15, at Camden, the following directors were re-elected: Cyrus Field Judson, Joseph Leiter, W. S. Jewell, Robert I. McKinstry. The president's report stated that the company had decided upon the extensive use of gasoline and steam omnibuses, the systems which have been adopted having stood the most rigid tests.

NEW YORK.

ALBANY—The Carriage Painters' Union has decided to apply to the Carriage and Wagon Makers' International Association for a charter. This union is composed of carriage painters, trimmers, woodworkers and blacksmiths. The election of officers was postponed.

BINGHAMTON—The McMahon Wagon Co., of this city, has been incorporated, with a capital of \$10,000. The directors are Michael McMahon, Matthew McMahon and Mary J. McMahon, of this city.

BUFFALO—The carriage and wagon manufacturers of Buffalo have organized for their protection. The first meeting was held at George Werner's, on May 19. Mr. Werner was elected chairman and Mr. L. A. Weller, secretary. The following members were present at the first meeting: George Werner, Bosche Bros., Thomas Derry, A. A. Austin's Sons, Fred Meyer, D. F. Reiman, Jr., M. H. Reiman, Jr., F. J. Vogt, Alexander Weller, Fred Wunster, George Werner, Jr., Fisher & Korn, H. L. Shepart. The new organization will be known as the Carriage and Wagon Manufacturers' Association of Buffalo.

CANASTOTA—Fire on May 29 partially destroyed the main building of the Watson Wagon Co. Insurance of \$14,000 will cover the loss.

CHADWICKS—Articles incorporating the Charles E. Chadwick Co., of Chadwicks, with a capital of \$15,000, for the manufacture of high grade vehicles, have been filed. The directors are Charles E. Chadwick, of Chadwicks, and John T. Shaw, of Utica. The output of the plant is two-wheeled vehicles.

CHERRY CREEK—T. H. Smith will soon build a new wagon shop, which will better accommodate his increasing business.

FARMER—Frank B. Leet has bought a half interest in the well established carriage business of his grandfather, A. H. Leet, and the firm will hereafter be known as A. H. & F. B. Leet.

FULTON—The factory of the Fulton Buggy Co. is running up to the top-notch every day in order to keep up with the orders for its product. They are now making a specialty of bike wagons in many different styles, with hard rubber and pneumatic tires.

HUNTINGTON—George Jackson has opened a wheelwright shop in connection with his blacksmith shop.

NEW YORK—Flandrau & Co., the Broome street carriage builders, report a good trade, and are showing a line of elegant vehicles for town and country, including all standard styles and novelties of the highest quality, from light and heavy carriages and victorias to buck-boards and pony phaetons.

Summer traps of all kinds have been selling well the past week at the repository of Edward Callanan's Son. They are showing a large assortment of open and basket work, both new and second hand.

Trade with the Mutual Wagon & Carriage Co. has been very good all of last week. At their repository, Eighth avenue and Bank street, where they are showing a large assortment of all kinds of wagons, customers may be found at almost any time of the day.

Orders for wagons still continue to come in at a very lively rate at the repository of the Lengert Wagon Co. They have been shipping quite a few to out-of-town customers, many going to Philadelphia and some to Boston.

The I. S. Remsen Manufacturing Co., of Brooklyn, report an extra large call for fine grade harness, of which they are showing an excellent assortment. The business wagon sale which they are now having has brought many customers to this establishment, and the result is that more wagons were sold in the past few days than in any two weeks of last year.

James W. Renwick is displaying a magnificent assortment of spring vehicles, embracing the newest designs and color effects. Basket work in great variety is shown, and has been having a very large call.

At the Studebaker carriage and harness establishment business has been exceedingly good during the last week. Several of the new style carriages have been disposed of, and their stock of 1900 styles is attracting a great deal of attention. They are showing some remarkably good things in the newest designs.

J. B. Brewster & Co., at the Old Guard Building, have a magnificent collection of spring vehicles, embracing the newest designs and color effects. One of their specialties is basket work in great variety.

At the old established carriage repository of W. H. Gray there may be seen a fine line of carriages of every style for city and country use, at prices that will meet the approval of purchasers.

NEWBURGH—The large carriage repository at Newburgh, which has been conducted for the past twenty years by Frank Bradley, has been purchased by W. C. Johnson, of the Newburgh Carriage Co., and Abram Fowler, of Middlehope.

UTICA—Dellas Marvin and Harry Hamblin have opened a paint shop in the Gridley hop pressing building, and will paint wagons, carriages, etc.

OHIO.

GALION—The Central Ohio Buggy Co.'s works were destroyed by fire on May 23. Loss, \$30,000, insurance partial; the Capital Hotel, total loss, insurance nominal.

FINDLAY—The Findlay Carriage Co. are arranging to put up a new factory building, to have a frontage of 96 feet on West Crawford street and 50 feet deep. The building will be three stories high, and will be constructed of stone and pressed brick.

PENNSYLVANIA.

COLUMBIA—The Columbia Wagon Co. has voted to increase its capital stock from \$100,000 to \$150,000.

CANTON—The large wagon and blacksmith shop on Sullivan street, belonging to Dunbar & Hartranft, was totally destroyed by fire on May 23 about 1:30 o'clock. Cleveland's Block, adjoining the shop, caught fire, but was extinguished before much damage was done. The fire originated in the chimney, and, although the shop was situated in the business portion of the town, was not discovered until it was well under way. The loss will be quite heavy, several buggies, cutters and nearly all the tools belonging to Dunbar & Hartranft being burned. The entire property of Messrs. Carman & Bristow, who had repair and paint shops on the second floor, was destroyed.

WILKESBARRE—An extensive addition is to be built to the Wilkesbarre Axle Works for the manufacture of carriage springs.

YORK—The Martin Carriage Works is to become a corporation under the name of the Martin Carriage Works. Application for a charter for the same will be made. The corporation will be composed of the following: Milton D. Martin, Peter A. Elseser, William Keyworth, Martha J. Martin and Jere Carl.

RHODE ISLAND.

PROVIDENCE—William Corliss, of this city, has invented a new pneumatic tire of peculiar form, in which there is a combination of rubber, spring steel and fabric.

VERMONT.

CHELSEA—P. W. Rodgers has sold his carriage business to Arthur, his son, who took possession May 1. Mr. Rodgers will remain in the shop for the present.

VIRGINIA.

LYNCHBURG—A charter has been granted in the Campbell County Court to Messrs. E. C. Ivey, William B. Taylor, E. S. Taylor, C. S. Minor and R. D. Martin, for the formation of a company to be known as the Taylor Wagon Works, the object of which will be the manufacture and sale of all kinds of vehicles, including wagons, drays, carts, trucks and buggies. The capital stock is to be not less than \$15,000 and not more than \$25,000, to be divided into shares of \$100 each. The officers for the first year are C. S. Minor, president; W. B. Taylor, vice-president; E. C. Ivey, secretary, and E. S. Taylor, superintendent. These officers, with R. D. Martin, constitute the directors.

Wants.

Help and situations wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word.

SITUATIONS WANTED.

Wanted—A steady job by a competent carriage painter and trimmer. An all-around man in both. Address, **GILBERT DILLARD**, St. Augustine, Fla.

Foreman trimmer desires a change. Experienced on cheap and medium grade work. Now with a large Michigan factory. Can give good references. Address, "H," care of **THE HUB**.

An experienced carriage smith would like a permanent position in or near New York City, as a finisher on the repair floor, and to make himself generally useful. Correct habits, middle aged, a good manager, and can speak both English and German. Best of references. Moderate salary. Address, "ENERGETIC," care of **THE HUB**.

Experienced New York City foreman carriage painter is open for engagement in or near New York City. Accustomed to good light and heavy work. Steady and reliable. Address, "BRUSH," care of **THE HUB**.

Wanted—Contract for season of 1901 for complete construction in factory producing 2,000 vehicles or more, by two practical men. Competent in drafting, building, trimming and finishing vehicles. References. Address, "CARRIAGE MFRS.," care of **THE HUB**.

Wanted—Position as foreman carriage paint department in good factory or good custom shop, by steady, temperate man, twenty-four years' experience. For past six years have held large contract. Western experience. Address, "CONTRACTOR," care **THE HUB**.

HELP WANTED.

A first-class carriage trimmer for heavy and light work. Would prefer a young unmarried man. Address, with references, stating salary expected, **R. E. K. B.**, care of **THE HUB**.

Wanted—First class carriage smith on heavy work. **JAMES GOULD COMPANY**, Albany, N. Y.

Wanted—Three carriage trimmers, or trimmer to take the contract, or man to work on tops, or one man to work on backs and cushions, at **NOVELTY CARRIAGE WORKS**, Wilmington, Del.

Wanted—Superintendent for carriage factory making a full line of medium and high grade work, with an annual output of 6,000 to 8,000 vehicles. Must be experienced and thoroughly first class man with modern ideas. Address, "BOX 50," care of **THE HUB**.

A first-class foreman for carriage factory working at present about fifty men, building the best grade of work only—fine business wagons and heavy carriages. Would prefer a young man who is not married. Address, stating experience, references, salary expected, etc., **R. E. K. A.**, care of **THE HUB**.

Wanted—Hustlers to secure new subscribers for **THE HUB**. A good chance to make money easily. Subscription price \$2.00 a year. Liberal commission paid. Address, Subscription Department, **THE HUB**, 24-26 Murray street, New York.

MATERIALS WANTED.

PATENTS—**H. W. T. Jenner**, patent attorney and mechanical expert, 608 F street, Washington, D. C. Established 1883. I make an examination free of charge, and report if a patent can be had and exactly how much it will cost. Send for circular.

FOR SALE.

Carriage and wagon factory, also carry full line of farm implements. Largest plant of its kind in Central Missouri. Will bear inspection. Address, "K," Sedalia, Mo.

Solid rubber tire patent. Entirely new principle. Cannot get off the rim. Economical. Experienced tire men say it is the best they have ever seen. For particulars, address, "RUBBER TIRE," care of **THE HUB**.

Brick carriage factory, excellently equipped for automobile building. Four stories, 70 x 128. Located on corner. Elevators, 40 H. P. Corliss engine, first class machinery, etc. City of 75,000, about 100 miles from New York. Splendid shipping facilities. Factory now in operation and in good condition. Address, "M 25," care of **THE HUB**.

COLOR SECRETS.

No. 29.—Our Specialties.

One Store deals in the antique—will produce, or reproduce, anything that is old—has clerks who look like Time, and articles that smell of eternity. Another is fresh and blooming with novelties—delights in the peculiar and the unheard-of—makes you feel that you belong to a coming generation. Another makes a specialty of not being special—keeps the seasonable goods—gives you the prevailing mode—nothing out-of-date and nothing extreme. We are specialists in all three regards. We cover the whole ground. No Murphy customer ever needs to go elsewhere. We keep everything in the line of Colors.

Of course we make the standard shades—and they are standard—not close to it. Most men want what is usual; but want it unusually reliable—the common-sense article which has the rare value of common sense. It is our pride to supply this ordinary demand with extraordinary care: but we supply the extraordinary demands just as carefully.

Some people do not enjoy being like all other people—enjoy their individuality—want things different. Our business is to give you what you want. Is it something of the past? We have the entire history of Color making at your service. Ask for any old shade; and we'll hand it down. Nothing is ever out-of-print at Murphy's. Is it something novel? We have a genius who is devising it all the time. He'll tell you what you want, if you don't know; and you shall have it, as peculiar and striking, as delicate and charming, as you can desire. Send for a price-list.

MURPHY VARNISH CO.Please mention "The Hub" when you write.

To the Carriage Trade:

IN the pages following, from 42 to 51 inclusive, we are bringing to your attention the superior qualities of the Premier Wagon, and our object in so doing is to sell the gear used in this construction, as it is not our purpose to sell jobs in the wood and iron, except for introductory purposes. We have no facilities for manufacturing bodies, and we simply have them made for us to introduce the gear to the trade generally, and until this is accomplished we will furnish the trade with a few jobs in the wood and iron, and with the Premier gear only.

You will notice by the engraving that the body is special, and it would be well for manufacturers to order one job in the wood and iron as a sample, although if they prefer we can furnish them with blue-prints showing construction of body for this job, without extra charge.

As this is the only assembled vehicle which we offer or sell, we have designated it as "The Premier Wagon," and said name will apply to no other job properly, even though such jobs may have other gears made by this Company.

THE PREMIER TUBULAR gear is assembled with side bars only, as shown in the cuts in pages following.

THE CENTURY TUBULAR gear is assembled with Elliptic Springs, but we **cannot** furnish it assembled with body. For description of The Premier Wagon, please refer to the **nine** pages following.



PREMIER MANUFACTURING CO.,

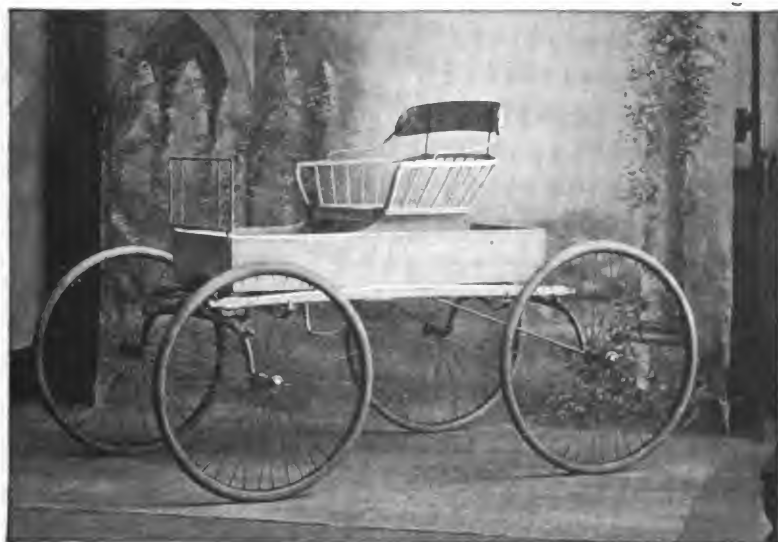
HARTFORD, CONNECTICUT.

Please mention "The Hub" when you write.

PREMIER

PREMIER

The Premier Wagon



OUTSIDE of New York City and a few fastidious road drivers elsewhere, side bar wagons have not met with special favor for some time past. This condition was brought about by the construction formerly used and the stiff riding qualities of such wagons.

Without question the side bar wagon is greatly preferred to the end spring wagon by road drivers, providing that equally good riding qualities are assured, as it is very much neater, more genteel, and follows a horse better.

THE PREMIER WAGON'S riding qualities are equal to the best and superior to the average Elliptic Spring Wagon ; further, it is built for hard everyday business use, and its enduring qualities, owing to its construction, are remarkable.

In the next several pages we will endeavor to give the why and wherefore, and trust you will agree with us.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M'F'G.
CO.

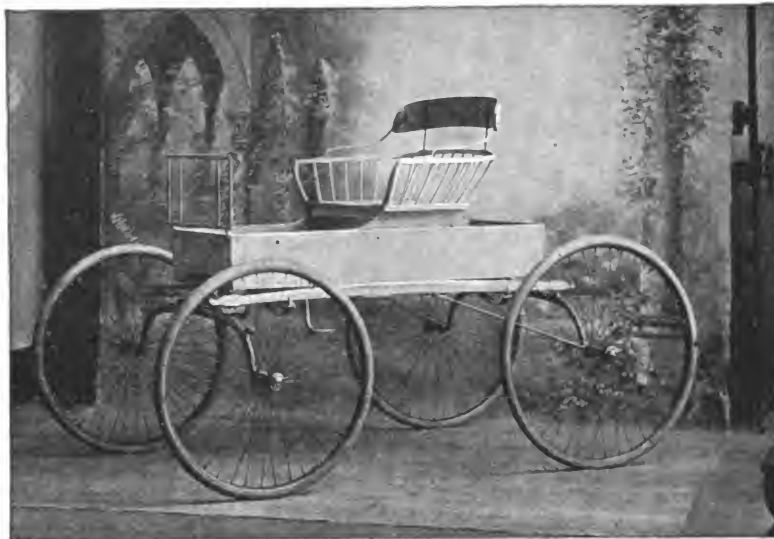
PREMIER
M'F'G.
CO.

Please mention "The Hub" when you write.

PREMIER

PREMIER

The Premier Wagon



THE Premier Gear which is embodied in the construction of the Premier Wagon is made of steel tubing of the highest quality, and each axle is made in one piece and without any brazed joints. The carrying capacity is slightly over 100 per cent. greater than the same amount of steel in solid form, and the rigidity is such that it is the only construction which can be safely used for high arch axles without innumerable braces and stays, which detract from the appearance and enduring qualities of a first-class job.

Every part of this gear is made of the best material obtainable, and when it is assembled it has true running qualities, obtained only by the most careful workmanship and special facilities for doing such work. It seems almost unnecessary to say anything about the Premier bearings, etc., as they are so well and favorably known that further description would seem like unnecessary repetition; however, we will be glad to give the fullest information regarding every part of this job and trust you will write us.



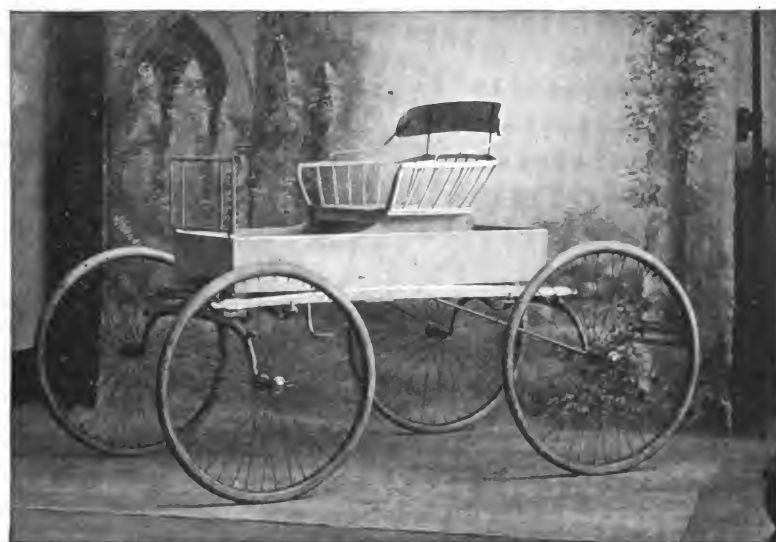
PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M'F'G.
CO.PREMIER
M'F'G.
CO.

Please mention "The Hub" when you write.

The Premier Wagon



THE Bodies used with the Premier Gear are made and ironed for us by one of the most careful builders in New Haven, whose reputation for good work is second to none, and when used with the Premier Gear a job is produced excelled by none, regardless of price.

The shafts, like the gear and the body, are made special, and their appearance corresponds to the high class appearance of the gear and body.

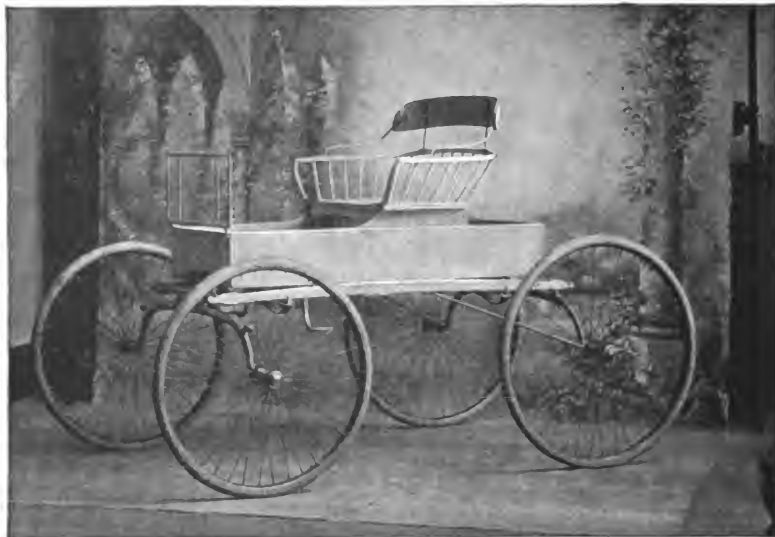
When selecting the various parts entering the construction of the Premier Wagon, we have endeavored to get the greatest carrying capacity with the least weight, and the fact that our regular two-passenger job weighs about 100 pounds less than the average two-passenger job, demonstrates that we have accomplished what we set out to do. We did not do this at the expense of strength, durability, etc., as the wagon will actually stand more rough usage than the heavier type, because every part entering the construction of it is made of the best material obtainable and assembled with the greatest accuracy. Please remember it retains all of the advantages of the side bar wagon and rides as easy as a wagon with Elliptic springs.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

The Premier Wagon



The Premier Wagon, as above illustrated, weighs :

For two passengers,	147 Pounds.
For one passenger, with springs, side bars and road tires, about . . .	102½ Pounds.
For one passenger, without springs, side bars and with track tires, about	76 Pounds.

For business, road driving, etc., the two-passenger job is without question the easiest running vehicle for the purpose which is made. It rides as easy as an end spring wagon, and is light enough to step a trotter without fear of ruining his gait. The axle is arched where it should be, and is stronger than any other known constructions. It is the cheapest wagon, because the gear will practically wear forever by renewing the bearings every few years.

Before offering this wagon to the public we have tested it in every conceivable way, and we are ready to say that it is "all right," and guarantee every part of it. We sell it only with high-grade tires, and the weight and size of the latter are governed by the style of the gear, as it is our aim to make this wagon first-class in every sense of the word. To assure you that we mean every word we say we are willing to send one of these jobs in the white to any good house on approval, and if it is not as represented they may return it.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

The Premier Wagon



THE above cut illustrates the one-passenger job with side bars, best grade of Timken springs, wire wheels with 30 and 32 x 1 $\frac{3}{4}$ inch tires. This wagon will weigh about 30 pounds more than a regular track wagon, but it can be safely used over all kinds of roads and its riding qualities are excellent. Owing to its rigidity and the fact that it is assembled absolutely true in every way it will draw much easier and follow a horse far better than the average 75-pound road wagon. This is especially true where the horse is unsteady or for amateur racing.

The same job, without side-bars, springs, and with regular track tires, will weigh about 27 pounds less. The 75 pound job is only intended for matinee racing, as we believe that only a track wagon can be made satisfactory without springs. There is not over one second's difference between the 75 and 100 (approximate) pound jobs, and we recommend the latter as its road riding qualities are excellent.



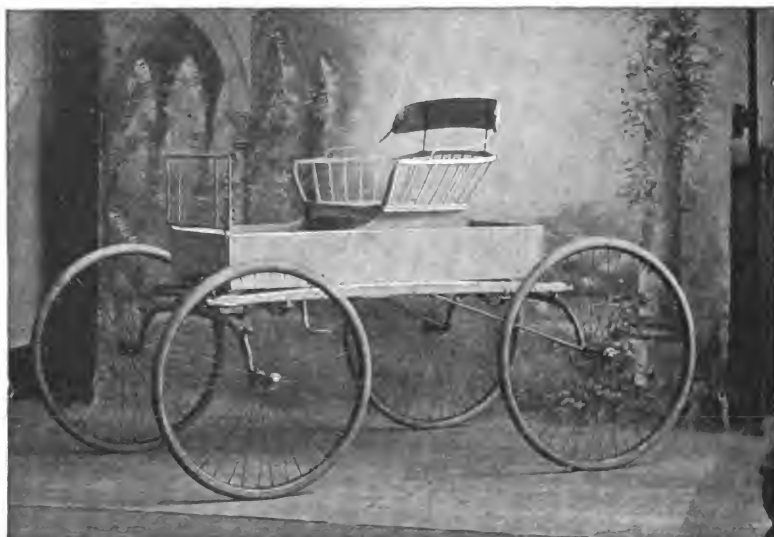
PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER

PREMIER

The Premier Wagon



AS illustrated above, we use on the two-passenger job wire wheels with 34 and 36 x 2 inch tires, but we also build the same gear with higher arch axles, on which we use wire wheels with 30 and 32 inch tires. We can furnish the gear with wire wheels and 1 3/4 inch tires when it is preferred, but we recommend the 2 inch tires, owing to the additional service they give and their superior riding qualities. You may not have thought of it before, but we find that a job of this kind, with the high-arch axle and 30 and 32 inch wheels, will draw lighter and is faster than the job with 34 and 36 inch wheels. Another thing may not have been brought to your attention: A 36 inch pneumatic tire will wear almost twice as long as a 46 inch pneumatic tire, also a 30 inch tire will wear nearly one-third longer than a 36 inch tire. In confirmation of the foregoing we might cite to you the fact that bicycles were first used with 60 inch wheels and were gradually brought down to 24 and 26 inches, and finally settled at 28 inches. The same thing can be said regarding the sulky, only the variation was greater, as pneumatic tires were used with 48 inch, 42 inch, 32 inch, down to as low as 16 inch, and finally settled on 28 inch; therefore, it must have been found to be the best size and the most satisfactory for the purpose. These points should be considered when ordering a wagon and we call them to your attention, and are pertinent to jobs intended for speeding purposes.

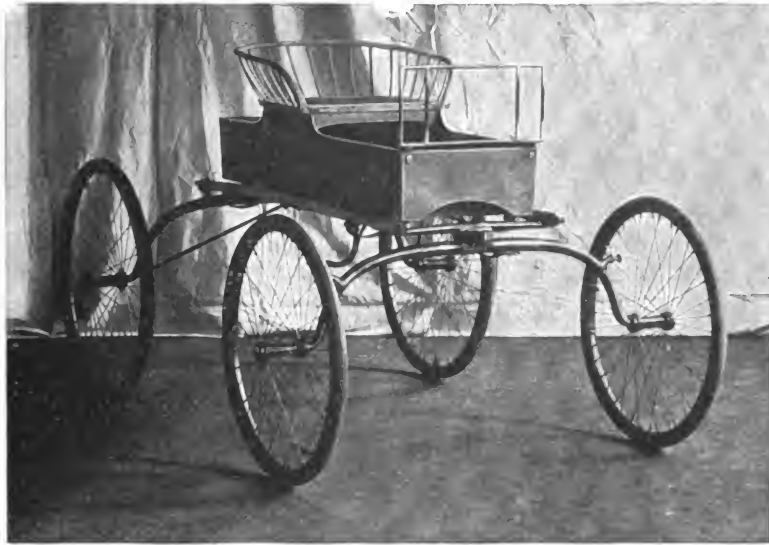


PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M'F'G.
CO.PREMIER
M'F'G.
CO.

The Premier Wagon



PNEUMATIC tires are not only practical on light wagons, but on every vehicle as well.

At the same time there is a certain percentage of drivers who are sticklers for light-weight vehicles of easy draft, and with that they demand an axle arched immediately back of the spindle, so they can step a trotter without fear of striking the axle. The job as above illustrated is specially intended for that purpose, and we can give you axle clearance from 22 inch to 26 inch.

For a 15-3 hand horse the above job just as it stands is the right height; it is fitted with wire wheels having 30 inch and 32 inch tires. The shafts are made special and set just right on the size horse mentioned above. In constructing this wagon every detail has been carefully considered, as we want the wagon to please you and your customers, and we know you will hear nothing but good words from every one which you put out.



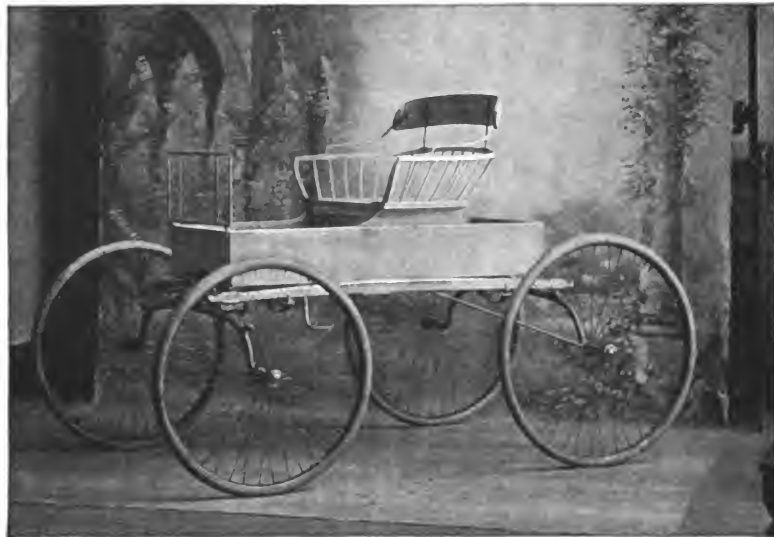
PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER

PREMIER

The Premier Wagon



EVERY good thing, like the Premier Wagon, offered to the trade is extensively copied, by some very cleverly and by others very crudely, but you cannot be mistaken on a genuine Premier if you will apply the weight test, to say nothing of a few exclusive parts about the gear, which we control.

We also make a tubular gear with Elliptic springs, which is a most excellent gear, as it is constructed like the Premier; that is, first class in every way, and we list it as THE CENTURY TUBULAR GEAR. We do not furnish this job complete in the wood and iron, because any 54 inch body can be fitted to it.

The Premier Gear requires a special body; therefore, we will furnish it in the wood and iron to builders who prefer to buy it that way, or until such time as they can make the bodies.

We will be glad to correspond with you about the job in the wood and iron, or the Gear, as we are prepared to furnish them in quantities.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M'F'G.
CO.PREMIER
M'F'G.
CO.

The Premier Wagon



AS we have said elsewhere, the durability, carrying capacity and riding qualities of the Premier Wagon have been thoroughly tested during the past three years. Some of these wagons, as above illustrated, have been in use for the past three seasons, and outside of the bodies and tires they are practically as good as new. One special job, which we have applied specially severe tests to we will refer to, weighs 119 pounds and has carried three people whose aggregate weight was 560 pounds, and it generally carries 400 pounds. After such severe usage constantly, we might say abuse, we find the gear and wheels in excellent condition. We simply mention the above to illustrate the great carrying capacity and enduring qualities of the Premier Gear as we construct it.

This job is strictly alone in its class, and is not put out in competition with any other pneumatic wagon, as it will be chiefly sought after by a class who are fastidious about all their driving vehicles, and recognize the value of a light wagon with great carrying capacity, light riding and easy running qualities.

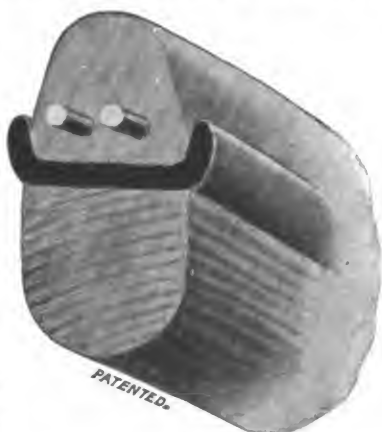
All wholesale builders of high grade work will furnish this job, when specified for, to dealers on short notice. While the price of the job is necessarily higher than other high grade wagons, we contend that it is the cheapest wagon on the market for reasons above stated.

We hope to list you among our good customers.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.



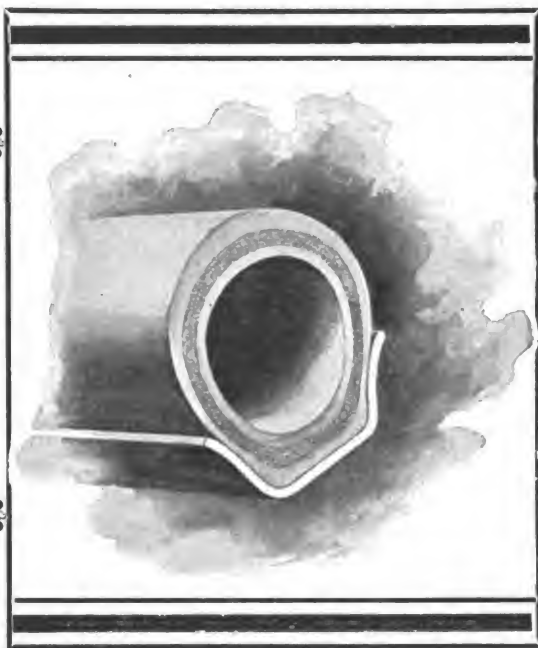
FINE CARRIAGE WHEELS

WE MANUFACTURE

SCHAD, SARVEN, WARNER, SWEET'S, KENNEY, COMPRESSED
BAND AND WOOD HUB CARRIAGE WHEELS.

We have one of the
the most complete
plants in the United
States for putting on
steel tires.

We also apply Solid
Rubber and Pneumatic
Tires at our Factory



and sell the wheels
complete. We use the
Kelly-Springfield solid
rubber tire and the
Clark Valveless Pneu-
matic tires, two of
the best rubber tires
made.

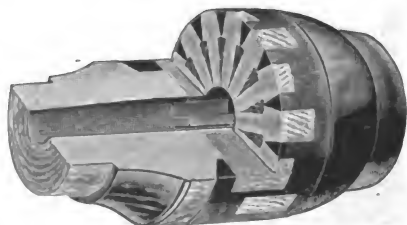
Our leader is the SCHAD HUB. This makes the neatest and most
durable wheel on the market for light work.



AVOCA WHEEL CO.,

AVOCA, N. Y.
U. S. A.

ESTABLISHED 1890



We are the Only Manufacturers of Carriage Wheels



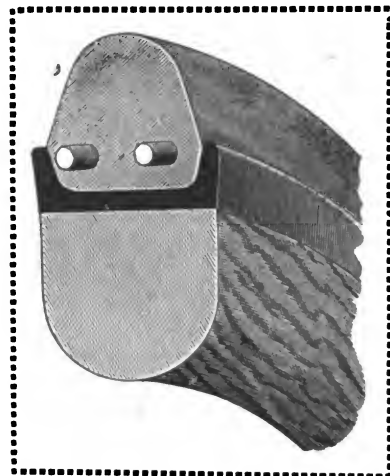
who make a specialty of applying
rubber tires at our factory and
sell the wheels complete.

WE USE

The Kelly Springfield Rubber Tire

...BECAUSE...

After undergoing the most severe and prolonged tests, it has been positively and thoroughly demonstrated that it is the most practical, longest lived and perfect solid rubber carriage tire made in the world.



They WILL NOT Roll Off.

Correspondence Solicited with Carriage Manufacturers
and Dealers throughout the United States and abroad.



The Batavia Carriage Wheel Co.,

BATAVIA, N. Y., U. S. A.

Please mention "The Hub" when you write.

HOOPES BRO. & DARLINGTON,

WESTCHESTER, PA., U. S. A.



Makers
of...

WHEELS

For




**Carriages,
Automobiles,
Business Wagons
and Trucks.**

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CRANE & MacMAHON,


No. 18 South Street,
NEW YORK.


FACTORIES:
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ST. MARY'S SPOKE WORKS,
And WAPAKONETA BENDING CO.

MANUFACTURERS OF    BRANDS OF
Carriage and
Wagon Wood Stock,
RIMS, SPOKES, HUBS, Etc.,
AND HARDWOOD LUMBER.
SEND FOR CATALOGUE AND PRICE LIST.



WHEELS Sarven,
Warner,
And WOOD HUBS, Heavy and Light.
Heavy Wheels for Business Wagons a Specialty.

The Hickory Nut  Brand is made of
Second Growth Hickory Rims, Spokes
and Elm Hubs.

The Acorn  Brand is made of Second
Growth Oak Spokes, Bent Oak Rims or
Sawn Felloes. Thoroughly seasoned stock.

O. W. SEBOLD, Pres't

J. H. BEACHLEY, Vice-Pres't

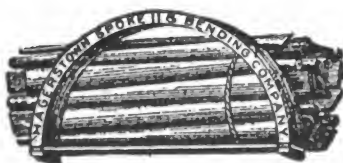
F. S. BARRICK, Sec'y.

S. A. MUNN, Treas.

A. S. HARING, Sept.


The **Hagerstown Spoke & Bending Co.** Hagerstown, Maryland,
U. S. A.

MANUFACTURERS OF
Spokes and Rims

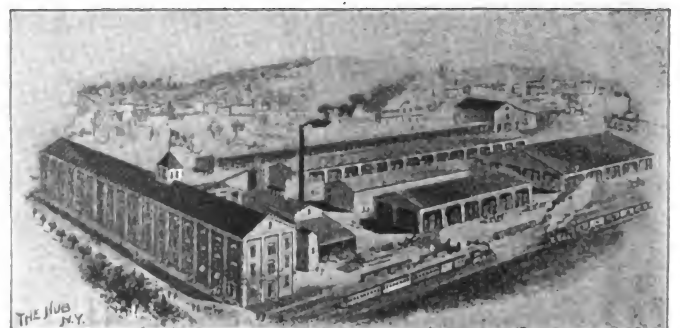


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HARDWOOD, OAK,
HICKORY AND WALNUT
LOGS AND LUMBER.

The celebrated
"Horseshoe"
brand, of which
we export
largely. All
Foreign and
American
patterns of
Spokes.

TRADE

MARK

Please mention "The Hub" when you write.



A. B. C. Code Used.


Correspondence Solicited.

Cable Address, "SEBOLD."

Edward Stinson & Co.,

**BALTIMORE...
WHEEL FACTORY.**

MANUFACTURERS OF

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Sarven, 
Plain,

Compressed
Band,

 Star

WHEELS

ALL SIZES.

ALSO,

SPOKES, RIMS,
and HUBS.

Send for Price List No. 12.



OUR MAKE WARNER WHEEL.

327-335 North Street,
BALTIMORE, MD.

WE FURNISH SPRINGFIELD
Rubber Tires

CARRIAGE WHEELS

of all kinds for Domestic and Export Trade.

AUTOMOBILE WHEELS
A SPECIALTY.

WRITE FOR PRICE LIST.

CARR, PRESCOTT & CO.,

Successors to
BIDDLE & SMART CO. AND LOCKWOOD & BROWN,

AMESBURY, MASS.



Telephone, No. 68-5.

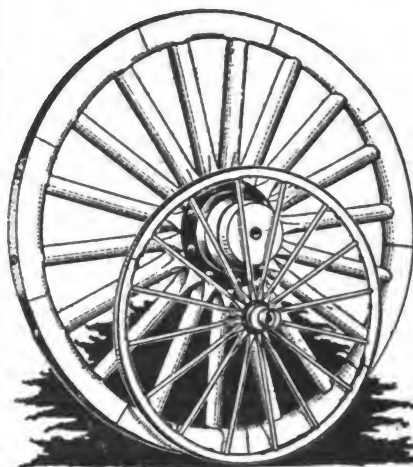
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Mechanicsburg, Pa.,

Manufacturers of

LIGHT and HEAVY WHEELS

Wheel Stock and
Hard Wood Lumber.



WHEELS

Wheels as Low as \$3.90 Per Set.

I make a specialty of furnishing Tired Wheels with Axles
Welded and Set, and Boxes Set. I make all sizes and
grades, with or without Steel or Rubber Tire.

SEND FOR CATALOGUE.

WILLIAM W. BOOB, CENTRE HALL, PA.,
U. S. A.

Manufacturer and Jobber of WHEELS, GEARS, CARRIAGE and WAGON
HARDWARE of EVERY DESCRIPTION.

SMALL CUTS FOR ADVERTISEMENTS



We carry a special line of new cuts of up-to-date
vehicles, and will send you sample proofs if you will
let us know what you want. Price 75c., postage paid.
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MECHANICSBURG,

Cumberland County,

PENNSYLVANIA.

J. B. KOLLER & CO.,

MANUFACTURERS OF

Spokes, Rims, Hubs and

Rough Wagon Poles.

FINE CARRIAGE WHEELS.

E. FLICKINGER,

President and Manager.

Capacity 500 Sets per day.

OUR TIRE PLANT ENABLES CARRIAGE
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PERIENCED WORKMEN. CAPACITY OF
TIRE DEPARTMENT, 250 SETS PER
DAY. CORRESPONDENCE SOLICITED.

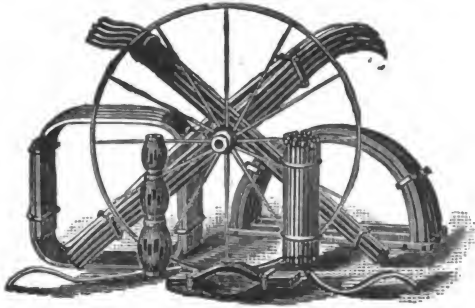
THE FLICKINGER WHEEL CO.,

MANUFACTURERS,

GALION, OHIO.

Please mention "The Hub" when you write.

The Wheel and Wood Bending Company,



WHEELS

MANUFACTURERS OF

Wheel Material and Bent Wood,

Send for Catalogue.

BRIDGEPORT, CONN.

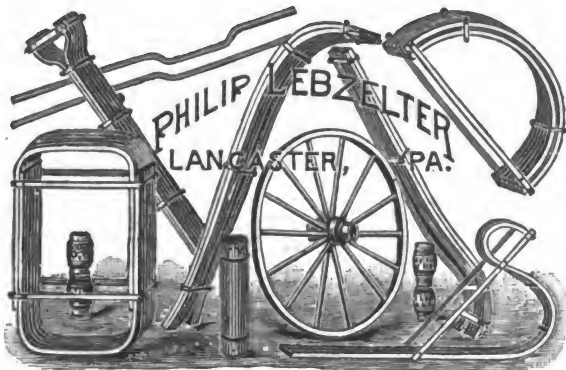
EAGLE WHEEL and BENDING WORKS,

PHILIP LEBZELTER, Proprietor

Manufacturer of

SECOND-GROWTH HICKORY AND OAK BENT RIMS, SHAFTS, BOWS, SPOKES, WHEELS, REACHES, AND BANDED HUBS.

WHEELS WITH STEEL TIRES.



WHEELS WITH RUBBER TIRES.

Established 1856.

LANCASTER, PA.

BALTIMORE HUB FACTORY,

JOHN STINSON, Proprietor.

325, 327, 329 and 331 North Holiday Street,
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ESTABLISHED 1870.

Manufacturers of WARNER, PLAIN, STAR AND BANDED WHEELS, HUBS, ETC.

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CARRIAGE AND WAGON MATERIAL,

Wagon Poles,
Cart Shafts,
Cart Gears,
Gum Rollers,
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Prices meet all
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WELDING
COMPOUND.**

It Welds Steel Tires, Axles and Springs as Easily as Iron.

HARDWARE DEALERS SELL IT.

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"OLD RELIABLE"

AND OTHER IRONED UP SETS.

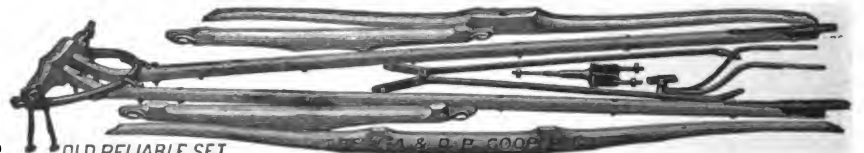
**JUST LOOK AT
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And We Have Several More.

*They are "SO CONVENIENT
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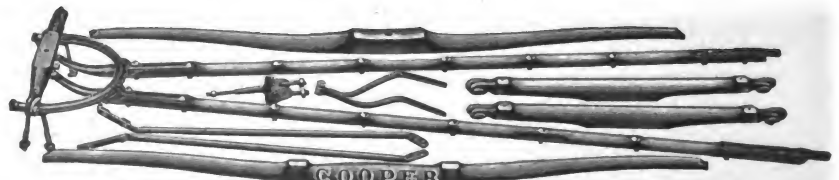
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Send for our New **RED BOOK, No. 5.** It
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No. 40.—Set B, 12 x 11-16 in. Brewster Circle, $\frac{3}{4}$ x $\frac{1}{2}$ in. Reaches, No. 2 King Bolt.



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Highest Grade of Carriage Woodwork.

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WAGON,
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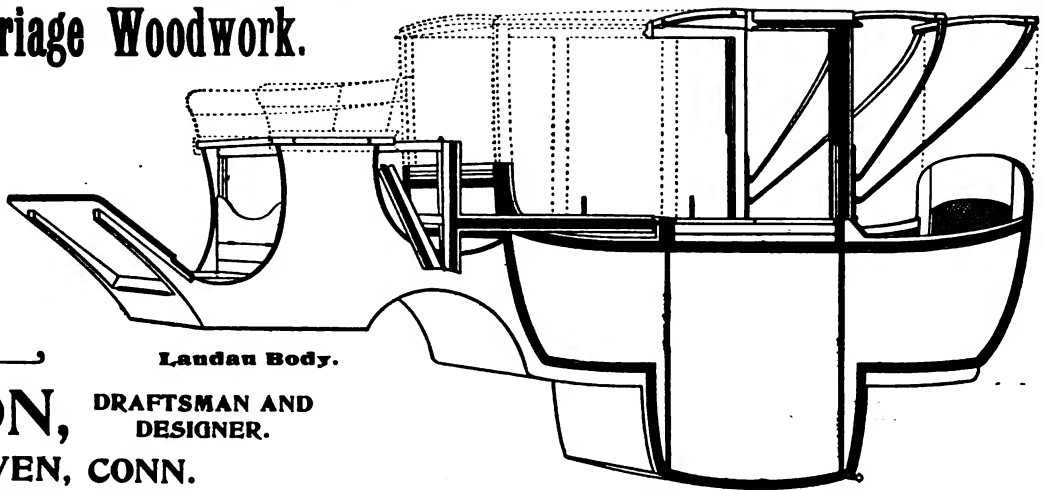
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Every Size and Description.
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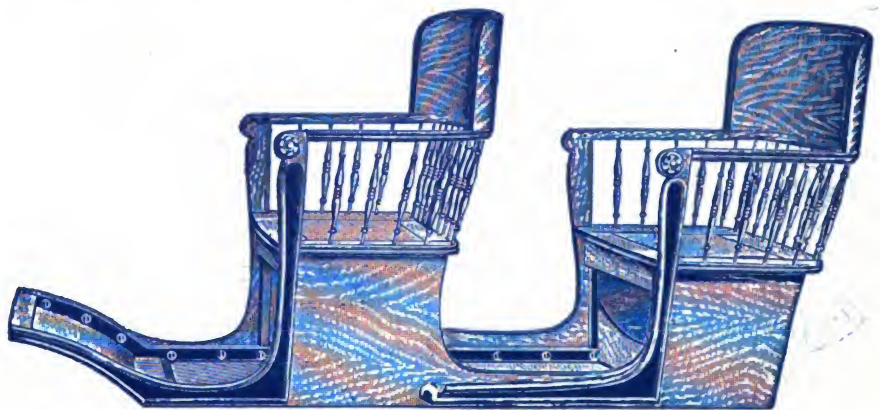
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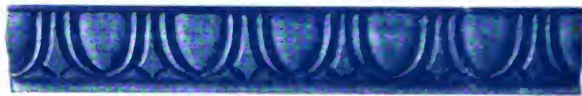
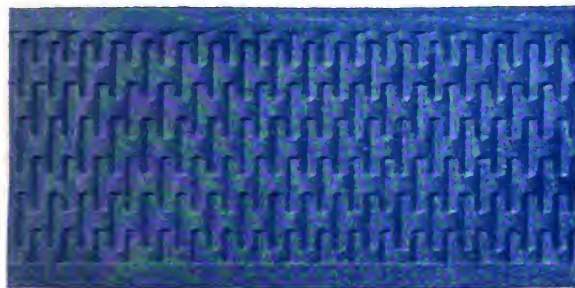
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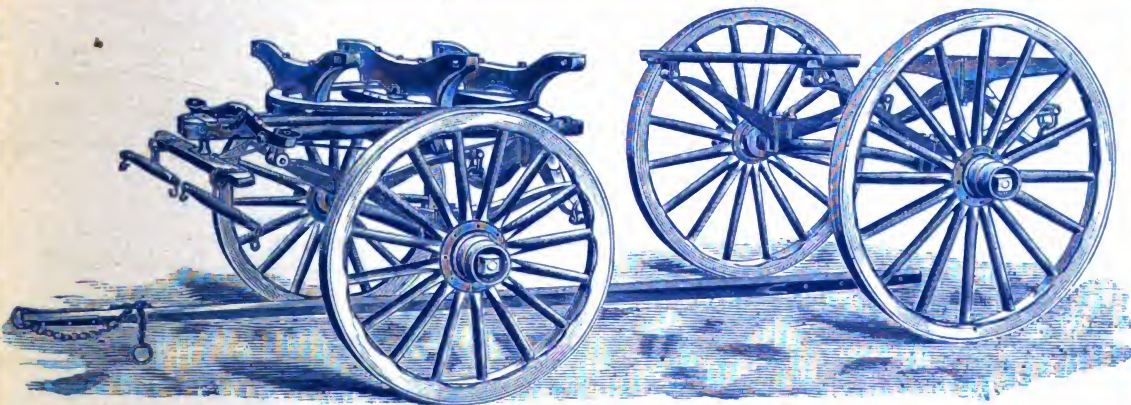


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They are not pressed, but cut. A great variety of patterns.
Made in any wood, and any size to 12 in. wide to 12 feet long.

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Complete Gears as shown above ready to receive body, for light and heavy work, can be furnished promptly. In ordering give full specifications, or such description as will enable us to make up specifications. Dealers in wagon materials will quote prices on our gears.

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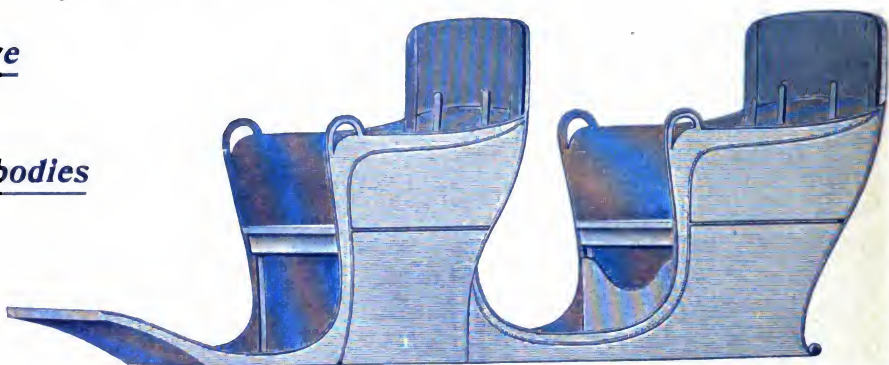
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Many new and attractive
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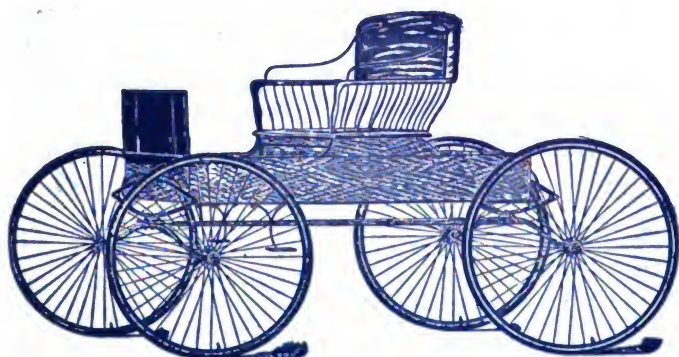
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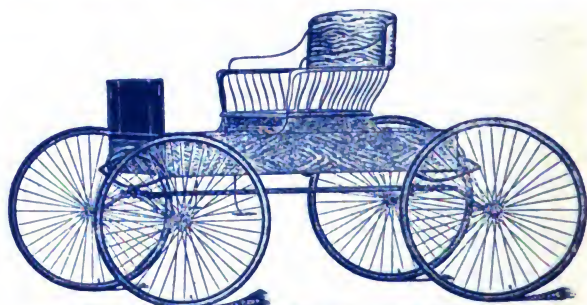
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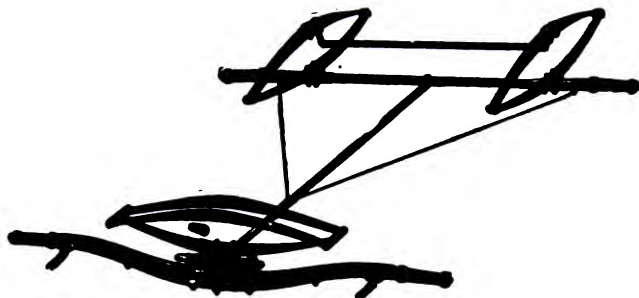
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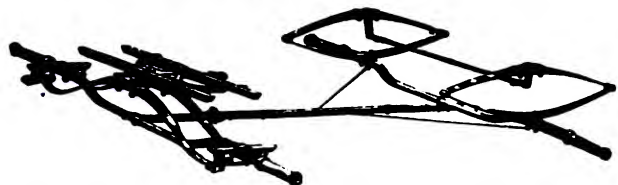
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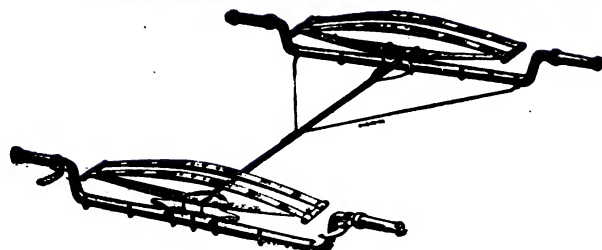
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Send for our
1900 catalogue,
with full line of
gears, wagons
in the white
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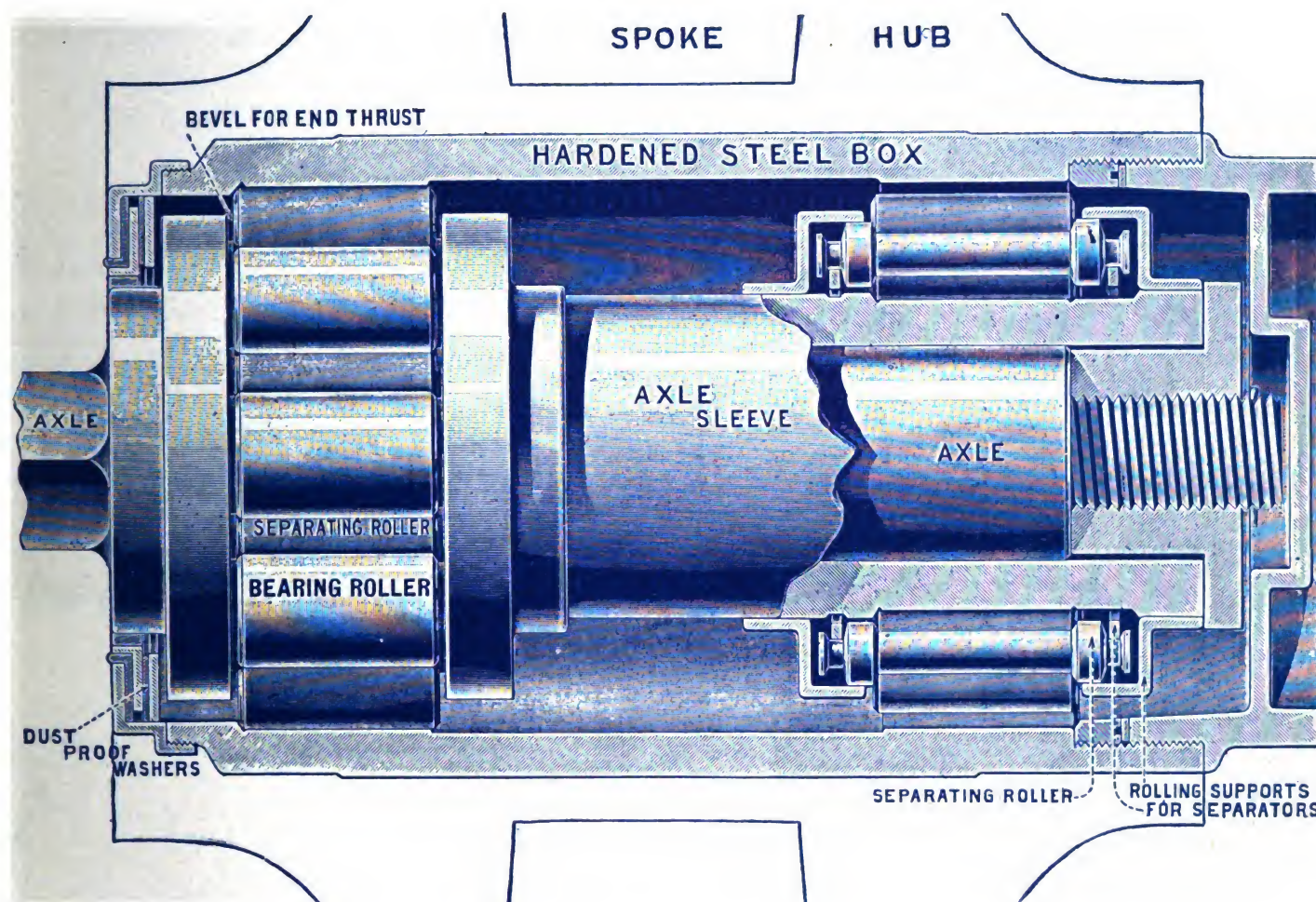
Patented Feb. 16, 1897.
Double Elliptic End-Spring Drop Axle Gear.

Manufactured Solely by

FITCH GEAR CO.
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THE AMERICAN ROLLER BEARING CO.

OFFICES, 27 State Street, **BOSTON, MASS.**
FACTORY, 32-40 Binford Street,



The A. R. B. Bearing is adapted to heavy work of all kinds. It has a number of features which distinguish it from any other Roller Bearing ever manufactured; among them are the following:

1. Its rollers are not held by pivots or confined in a cage of any kind.
2. The device for separating the bearing rollers is a purely rolling device, namely, a smaller set of intermediate rollers.
3. These separating rollers are held in position by purely rolling supports. So that there is no rubbing friction in the whole bearing, but only that slight friction which comes from the pure roll of one polished steel surface upon another.
4. All of the rolling parts are of a fine grade of steel, carefully hardened and accurately ground.
5. There is no complicated provision for the end thrust, but merely a hardened bevel against which the rollers roll when there is a thrust. These bevels have been found capable of withstanding the heaviest shocks and strains.
6. Once oiled (to prevent rust only) and the bearing needs no attention for six months or more.
7. A large electric car wheel weighing about 150 pounds, and hung on a stationary axle, will run for one hour and ten minutes when

once set in motion by the hand. When accurately balanced the weight of a piece of blotting paper will set it in motion.

8. The A. R. B. uses larger rollers, in proportion, than any other roller bearing, and consequently a slightly larger box is necessary—a fact which is amply justified by the great gain in strength, power and wearing qualities.

9. The A. R. B. is fully guaranteed, and it is about the only roller bearing that is guaranteed.

10. It is adaptable to a railroad car or a bicycle, to shafting and machinery of all kinds; for high speeds it is particularly successful, because of the absence of heating.

11. After a long series of competitive tests with many other roller and ball bearings, the A. R. B. has been adopted by many of the largest automobile concerns in this country.

12. With a pure rolling action, an ample bearing surface, and the most accurate mechanical construction, the A. R. B. stands to-day the only practically and theoretically perfect bearing in the field.

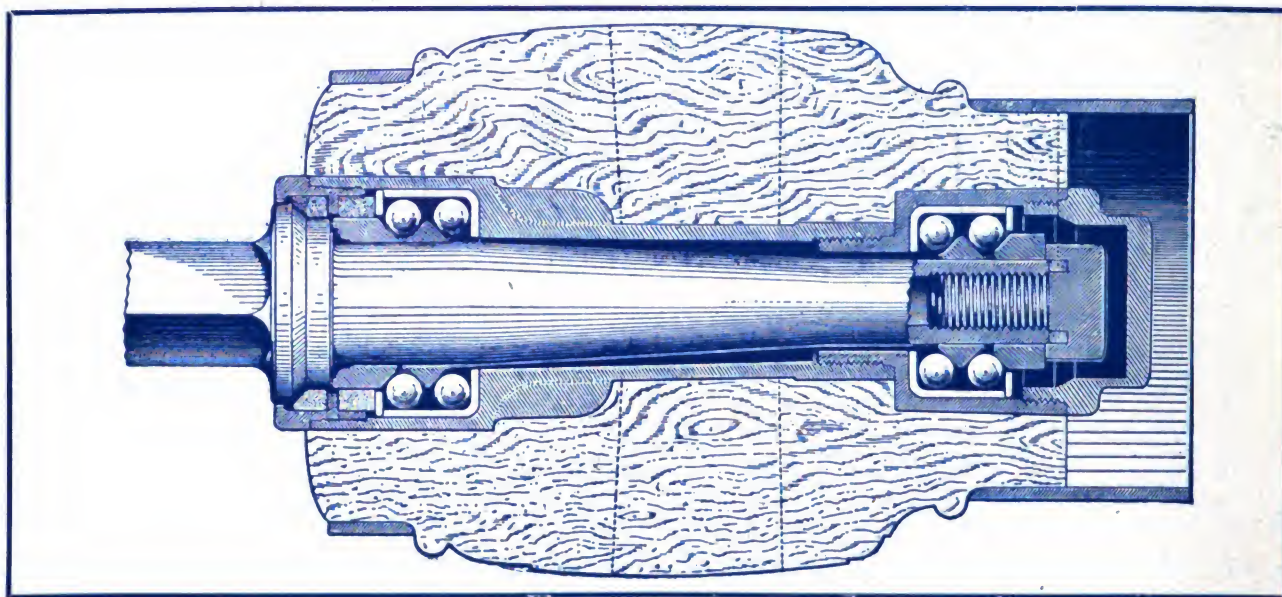
WRITE FOR CIRCULAR. THE FOREIGN PATENTS FOR SALE.

An exhibit of the American Roller Bearing Company may be seen at the Paris Exposition of 1900, consisting of several odd wheels and models and two motor vehicles fitted with the A. R. B., one a Riker Electric Vehicle, the other a Locomobile.

Please mention "The Hub" when you write.

• THE • BAKER BALL BEARING AXLES

THE MOST NEARLY PERFECT ANTI-FRICTION AXLES IN THE WORLD.



THEY REQUIRE NEITHER SKILL NOR A MECHANIC TO CARE FOR THEM. ARE ADAPTED FOR ALL KINDS OF VEHICLES USING AXLES FROM 5-8 INCH TO 5 INCHES

These axles have been found by some of the most reliable automobile companies to be the best and most satisfactory anti-friction axles on the market.

THE UNITED STATES BALL BEARING CO.

Townsend Building, Broadway and 25th Street,
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A SUCCESSFUL AXLE

EMPIRE AND CHICAGO
BALL-BEARING AXLES and DUST PROOF BANDS,
 For Carriages, Trucks and Motor Vehicles.
 (Sizes, $\frac{1}{2}$ to 4 inches.)



BALL-BEARING AXLE DEPARTMENT
 OF
 THE CHICAGO SCREW CO.,
 CHICAGO.

ESTABLISHED 1872.

Address All Communications to the Company.

Especially Satisfactory for Heavy Work.

"THE FAMOUS PORTER PATENT DUST PROOF AXLE." FOR LONG DISTANCE USE.



THE ONLY "2,500 MILE" STANDARD AXLE IN EXISTENCE

By actual test this Axle has run 2,500 miles with one oiling, and 1,500 miles with one oiling without the *Lubricating Pad*.

Porter Patent Ball Bearing Axle.

This axle is fitted with the Famous Porter Patent Dust Proof Collar and V-shaped extension, making it absolutely dust and water-proof.

7,000 sets in use. Never had a ball crush. Never had a call for repairs. Write for particulars.
 Prices now within reach of all.

Manufactured by **Buchanan Ball Bearing and Dust Proof Axle Co.,**
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When your eye catches this, Stop. Take pen and write for NEW CATALOG and PRICE LIST.

We can interest you and give

Better Goods, Better Service than elsewhere.



Prices Interesting.
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 Save Time and Money.

Write us Before
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Concord Axle Company,



Original Manufacturers of the



GENUINE CONCORD AXLES.



CONCORD EXPRESS AXLES.



BROWN'S PATENT ROLLER BEARING AXLES.

*All of carefully selected stock and of
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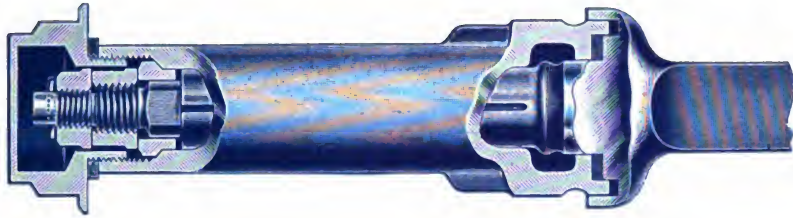


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CONCORD AXLE CO., **PENACOOK,** **N. H.**

THE DALZELL FULL COLLINGE AXLES

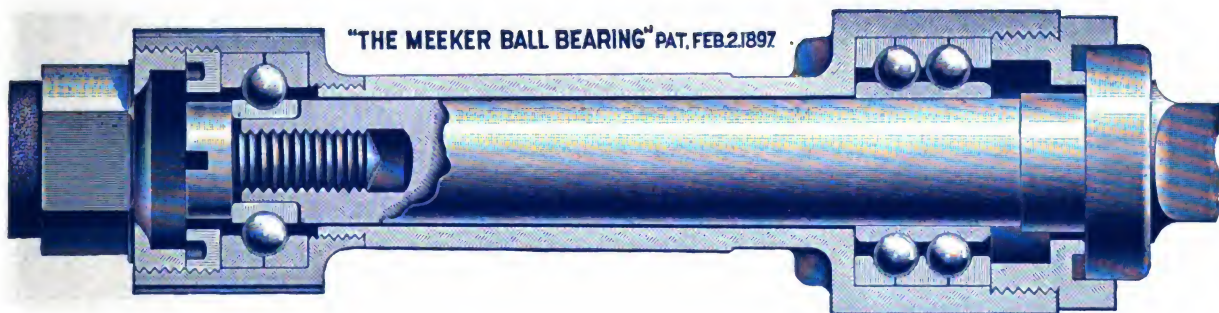
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When fitted with the Wrought Iron Case Hardened Boxes, they never heat or stick; they never break or wear out. The two polished surfaces running together make an Ideal Bearing, reducing the friction to a minimum. Carriage Builders who use these axles never have any trouble with them.

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DALZELL AXLE CO., SOUTH EGREMONT, MASS.

THE MEEKER BALL BEARINGS



Cheapest! Because they are the best. All sizes built in proportion to the work required of them.
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LOW WOOD HUB AND SARVEN WHEELS.

The Best Wheels Made, with Pneumatic Tires and Ball-Bearing Axles, for Runabout Wagons and Automobiles.



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SPRINGS AND AXLES.

"OPEN HEADS," Either Plain or Rubber Bushed.



Capacity, 150,000 Sets Axles; 3,000 Tons Springs per annum.

ANY STYLE WITH "FELT PAD," SELF-LUBRICATING.



"DUG OUT" COLLAR WITH "DOUBLE FLANGE" BOX.

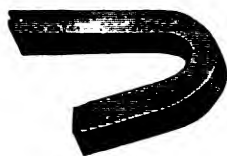
THE HESS SPRING & AXLE CO., CARTHAGE, OHIO.

THE SCRANTON AXLE WORKS,
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Manufacturers of
FINE VEHICLE AXLES
of Every Description.

OUR O. V. B. CONCORD EXPRESS is the best in the market.

We have sold in Chicago alone over 10,000 sets in four years of "OUR VERY BEST" Concord Axles, and not one complaint.



Axle Steel, lap welded and bent in weld.



Tire Steel, welded and bent in weld.

WELBING COMPOUNDS.

"CHERRY HEAT."

ONLY Welding Compound awarded MEDAL and Diploma at Chicago Exposition, 1893.

"EUREKA."

A New and Valuable Compound. RELIABLE. ECONOMICAL.

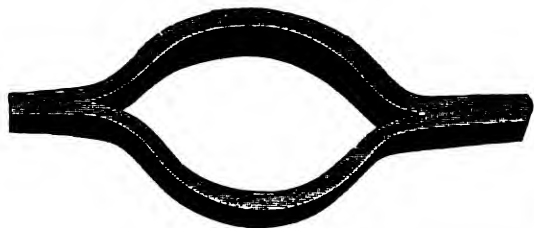
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THE WELDING COMPOUND CO.

Only firm granted a GOLD MEDAL (highest award) at Omaha Exposition just closed.

SEND FOR FREE SAMPLES, CIRCULARS, AND PRICE LISTS.

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Anvil Steel, welded at ends and forced open after welding.

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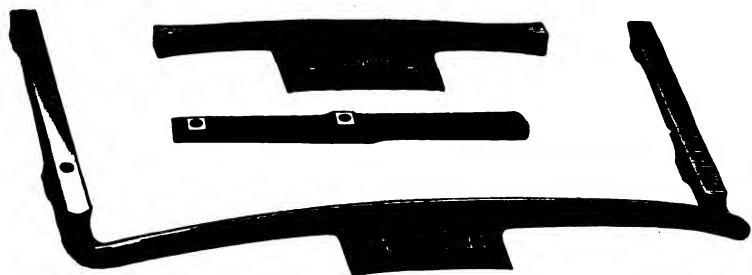
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Patented Dec. 9, 1897.
THE BAILEY BODY HANGER.

Be sure to give widths out to out and drops wanted.

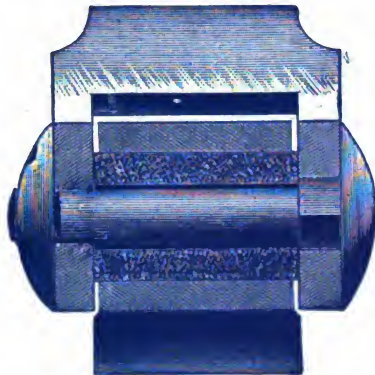
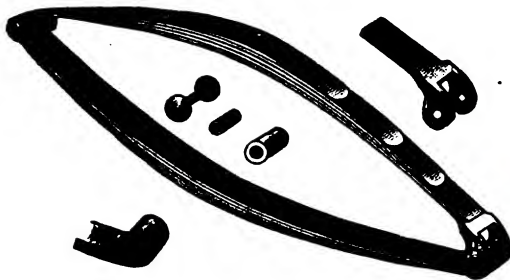
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Elliptic and Coach Platform Springs

WITH RUBBER OPEN-HEADS.

LARGE SIZE.—Designed for Broughams, Landaus and Coaches.

SMALL SIZE.—Designed for Buggies and Light Carriages.



The Rubber Open-Head

SPRINGS

Work Freely Without Friction.

No Binding or Squeaking in the Heads or Eyes.

Springs of Every Style and Pattern to order,
ALSO CURTAIN ROLLERS and CONCEALED HINGES.
Exclusively First-Class Work.—The Best that Can be Made.

SPRING PERCH CO.,
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IMPROVED POLE SPRING.



BRAKE SPRING.

WE CARRY EIGHT SIZES POLE AND BRAKE SPRINGS IN STOCK.

GET OUR CIRCULARS GIVING DIMENSIONS.

SPRINGS FOR ALL KINDS OF MACHINERY
MADE TO ORDER.

RAYMOND MFG. CO., Ltd.,

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This anti-rattler drives in or out in an instant, but never comes out accidentally. The best Wire Drive Anti-rattler made.

.....FIRST MADE IN AMERICA.....

“HAY-BUDDEN,” SOLID WROUGHT ANVILS.



MADE OF *Best AMERICAN Wrought Iron,*
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FORGED BY *Best AMERICAN Workmen.*

Experience has proven their worth and demonstrated that Anvils can now be made in this country **Superior in Quality, Form and Finish** to any imported.

FULLY WARRANTED.

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Received Gold Medal, Highest Award for Anvils at Omaha Exposition, 1898.

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Q. What other advantages has the Dayton Fifth Wheel?

A. It has a central clip tie, which, with a clip to be furnished by the user, gives the appearance of a Clip King Bolt without the objections to such a device.

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A. It does not turn with every movement of the axle.

Q. How can I get a sample?

A. By writing to The Dayton Malleable Iron Co., at Dayton, Ohio. Courtesy to this Magazine would suggest mentioning it in your letter.




THE NIELSON

Roller-Bearing Fifth Wheel

Is the only PERFECTED and PRACTICAL ROLLER-BEARING FIFTH WHEEL on the Market to-day.

HAS NO EQUAL. DON'T BE FOOLED.



WHY THE NIELSON IS THE BEST.

It is the product of a practical wagon builder, who has made a careful study of his trade and the necessity of developing something new in the way of a fifth wheel that would overcome the friction caused by the old circle in use on all kinds of platform vehicles. The present fifth wheel is the outcome of years of experiment, and contains all the good features lacking on other fifth wheels. The rollers, while an important part of the Nielson patent, without the other features would be as worthless as some others that are offered as "the best."

Don't let anybody tell you that So and So's Roller Bearing Fifth Wheel is just as good as the Nielson.

Roller-bearings, like ball bearings, to prove of value must be properly housed. This is one of the greatest practical points on the Nielson, as it is constructed so that neither dust nor the elements to which fifth wheels are subject can affect the rollers.

As the rollers overcome all friction, the use of oil, grease or other lubricants is obviated, and thus when once the Nielson is attached to a vehicle the user need give this part of the vehicle no further thought, as it will outlast any vehicle. It always works easy and never gets out of order. No worry about broken shafts or poles, as the Nielson turns easily under the heaviest load. It is a godsend to dray horses as well as to the users of vehicles for mercantile purposes as the Nielson not only saves the horses but prolongs the life of the vehicle.

YOU WANT THE BEST. GET THE NIELSON.

Ask your dealer or write for full particulars to

CHRISTEN NIELSON, 745 Third Avenue,

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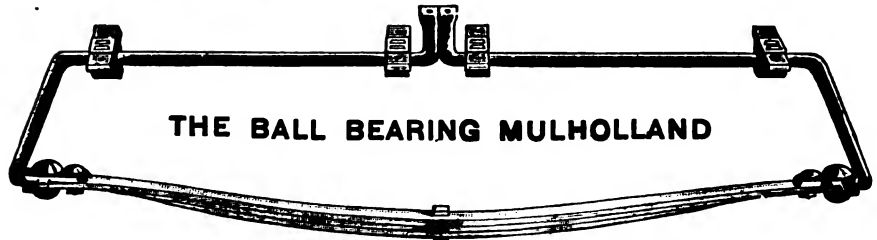


"THE OLD RELIABLE"
MULHOLLAND

That Have Stood
The Test of Time.

Hundreds of Thousands of them
in use.

Adapted to All Classes of Light
Vehicles.



THE BALL BEARING MULHOLLAND

WE MANUFACTURE HIGH GRADE VEHICLES IN THE WHITE.

WRITE FOR CATALOGUE AND PRICES.

MULHOLLAND SPRING AND GEAR CO.,

DUNKIRK, N. Y., U. S. A.

THE "TRACER" TELLS.

THE "TRACER" TELLS Isn't it worth your while to learn what other Wholesale merchants know about Retailers who seek credit from you? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth your while to learn from other Wholesale merchants what record your would-be customer has made with them? The "Tracer" tells.

THE "TRACER" TELLS Isn't it worth your while to be able to ask several thousand merchants everywhere what they know about a man you want to know about? The "Tracer" tells.

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THE "TRACER" TELLS Isn't it worth while to learn your customers' inside business history, not from outside guesses, but from inside records; the actual experience of those who have dealt with them? To learn those things that determine character and business ability as well as financial strength? The things that make you trust or distrust a man? The things that come up in actual business dealings, but which an outsider cannot know? The "Tracer" tells.

THE "TRACER" TELLS Is he honest? Is he tricky? Is he careful, prudent, shrewd? Has he the qualities of success? Does he cancel orders unjustly? Does he make false claims for deductions? Is his record good or bad? Are his methods good or bad? The "Tracer" tells.

THE "TRACER" TELLS and it is the only thing that tells. Every business man leaves a record, widely scattered in the ledgers and in the minds of merchants far apart. That record, if gathered, is the best proof of what a man actually is, in his business relations. The "Tracer" gathers these scattered leaves and makes the record complete. The "Tracer" goes to thousands of Wholesale merchants everywhere. From them come a dozen detached bits of experience, concerning one man: together they show his whole business past, and his present condition. Has he ever bought? The "Tracer" tells. Is he getting slow? The "Tracer" tells. Is it time for caution? The "Tracer" tells.

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NATIONAL MERCANTILE AGENCY,

SUCCESSORS TO

EALY'S "BLUE BOOK" AND THE BANKERS' COMMERCIAL LEAGUE.

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Carriage Forgings.

A FULL LINE OF

Carriage Forgings

....AND....

Special Drop Forgings.



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Catalogue.

RICHARD ECCLES,
AUBURN, N. Y.



THE SPEEDWAY WIRE WHEELS AND AXLES

of all descriptions, high grade ball bearings with a perfect adjusting device. Light and durable. "Fastest" wheel on the market. Fully prepared to furnish all sizes and designs. Send for catalogue.

SPEEDWAY WHEEL CO., Ware, Mass.

...A SURE SUCCESS...

AUTOMATIC YOKE CO., Largest Yoke Mfr. in the World. **Indianapolis, Ind.**



*Standard Yoke for 1900.
Used by all high class Vehicle makers.*

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DEMAND IT FROM YOUR CARRIAGE MAKER.

WRITE FOR
PRICES AND
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**AUTOMATIC YOKE CO.,
Indianapolis, Ind.**

*Gentlemen:—I have tried your celebrated Grip Neck Yoke for training Wild Colts for some time, and find it perfectly safe even if the traces break off, the team pulling on Yoke. I am, yours truly,
Chas. Sheets. (Liveryman.)*

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SURREY

ESTABLISHED 1884

TRAP... SPEEDER

MOTOR

WIRE WHEELS

WESTON-MOTT CO

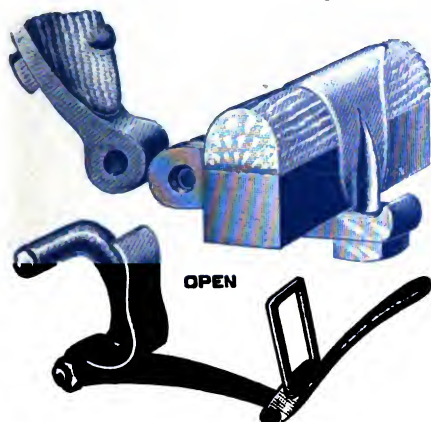
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**12 Styles Gear Sets
for Carriages**

**3 Styles Steering Axles
for Motor Carriages**

EMPIRE STATE SHAFT COUPLING.

QUICK SHIFTER AND ANTI-RATTLER.



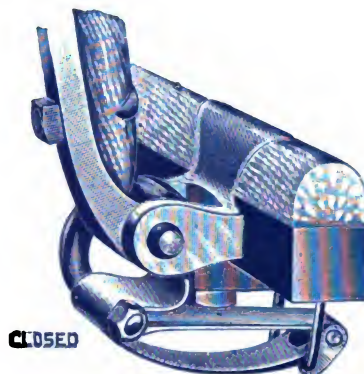
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JUST WHAT YOU WANT.

SAFETY COMBINED WITH UTILITY,
RAPIDITY and SIMPLICITY.

PATENTED MARCH, 1899.

The Safest, the Strongest, the Neatest
and the Best Quick Shifting Coupler and
Anti-Rattler ever offered on the market,
for the following reasons:



CLOSED

1. BECAUSE It is used with common draw shackles.
2. BECAUSE the spring is of best quality steel, one piece, without rivets to weaken same.
3. BECAUSE It has the strongest steel bolt, being one continuous piece, holding the shaft eye and spring with riveted nut.
4. BECAUSE the clip tie has a hook to prevent the lever from becoming detached.
5. BECAUSE the lever curves upward, avoiding all possibility of catching obstructions.
6. BECAUSE all parts are made of the Best Materials, Thoroughly Tested and Guaranteed.

It is not claimed to be the cheapest Coupler and Anti-Rattler on the market, but it IS the cheapest when Safety, Reliability and Durability are taken into consideration.

It cannot come loose. See the hook on clip tie. Clip ties are furnished free with every pair of the Empire State Anti-Rattler. Made in buggy and surrey sizes. Special prices to jobbers and large manufacturers. Write for quotations at once, as the "Empire State" would prove a strong selling point for your vehicles.

EMPIRE STATE SHAFT COUPLING CO.,

UTICA, N. Y.



**Lightning
Coupler.**

Patented
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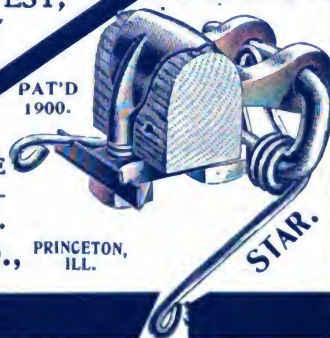
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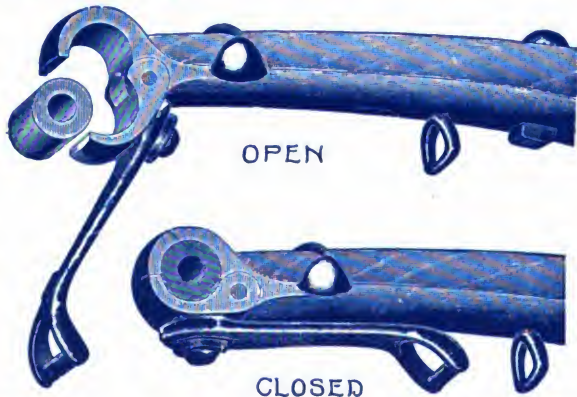
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The Bradley Shaft Coupling.

IT'S HANDY.

Only one hand is needed to operate this coupling.

No wrenches, hammers, punches, patience, or anything but the one hand is required.

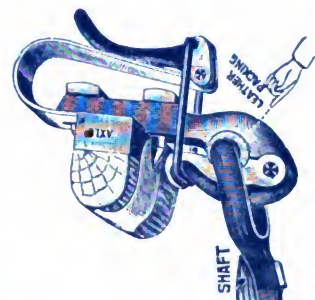
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Less than ten seconds if they are only to be removed.

The parts of this coupling cannot be lost—simply because there are no separate parts. It is complete in itself.



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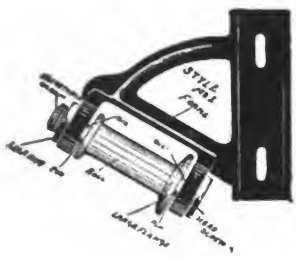
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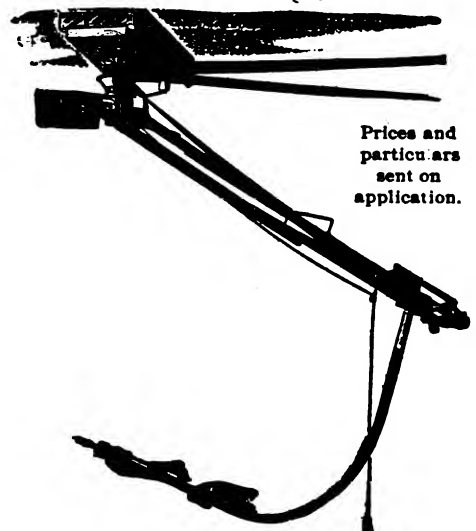
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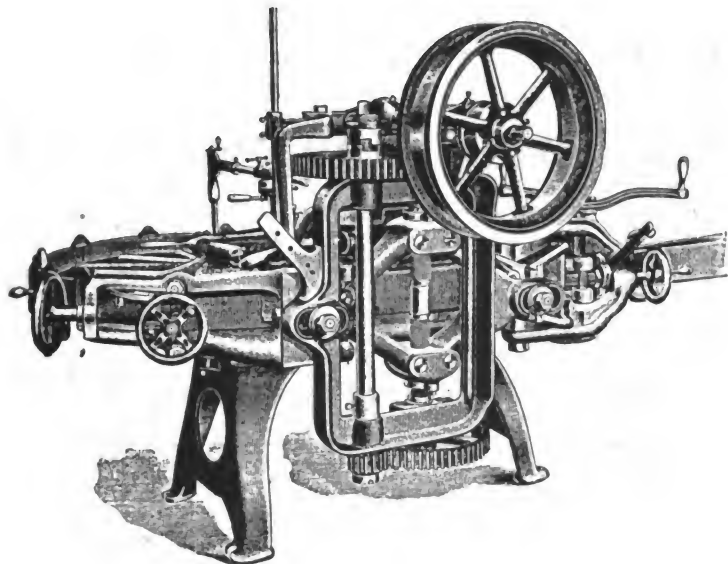
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TO SUPPLY THE DEMANDS OF THE
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A power machine with an automatic attachment, and where the operator has absolute control of the machine; can stop or start it instantly at any point in its operation.

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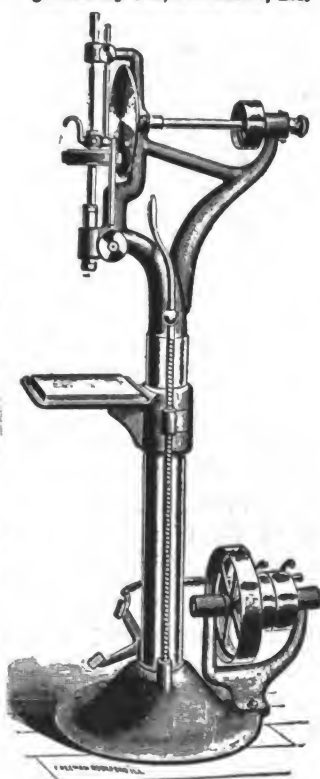
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The advantages of the Ideal are:

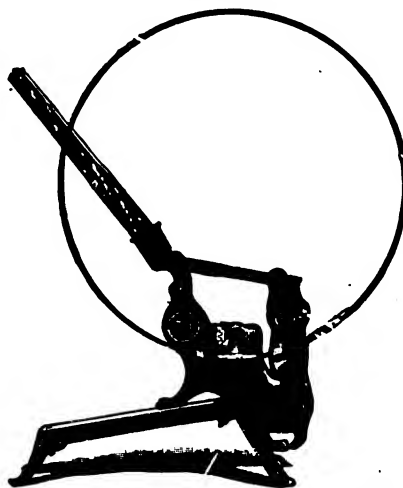
The tire cannot kink.
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It will shrink light Buggy tire.

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It will shrink perfectly all kinds and thicknesses of tire.

It is the easiest handled.
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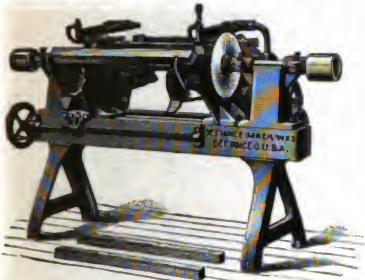
Defiance Machine Works, Defiance, O.

INVENTORS AND BUILDERS OF

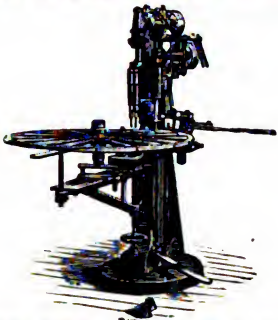
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FOR MAKING HUBS, SPOKES, WHEELS, WAGONS, CARRIAGES, RIMS, SHAFTS, POLES, NECK-YOKES, SINGLE-TREES, BARREL HOOPS AND HANDLES.

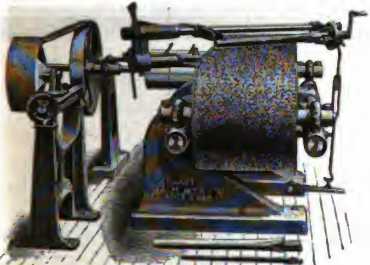
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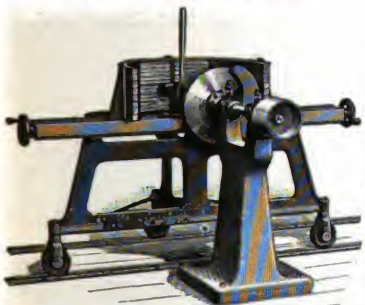
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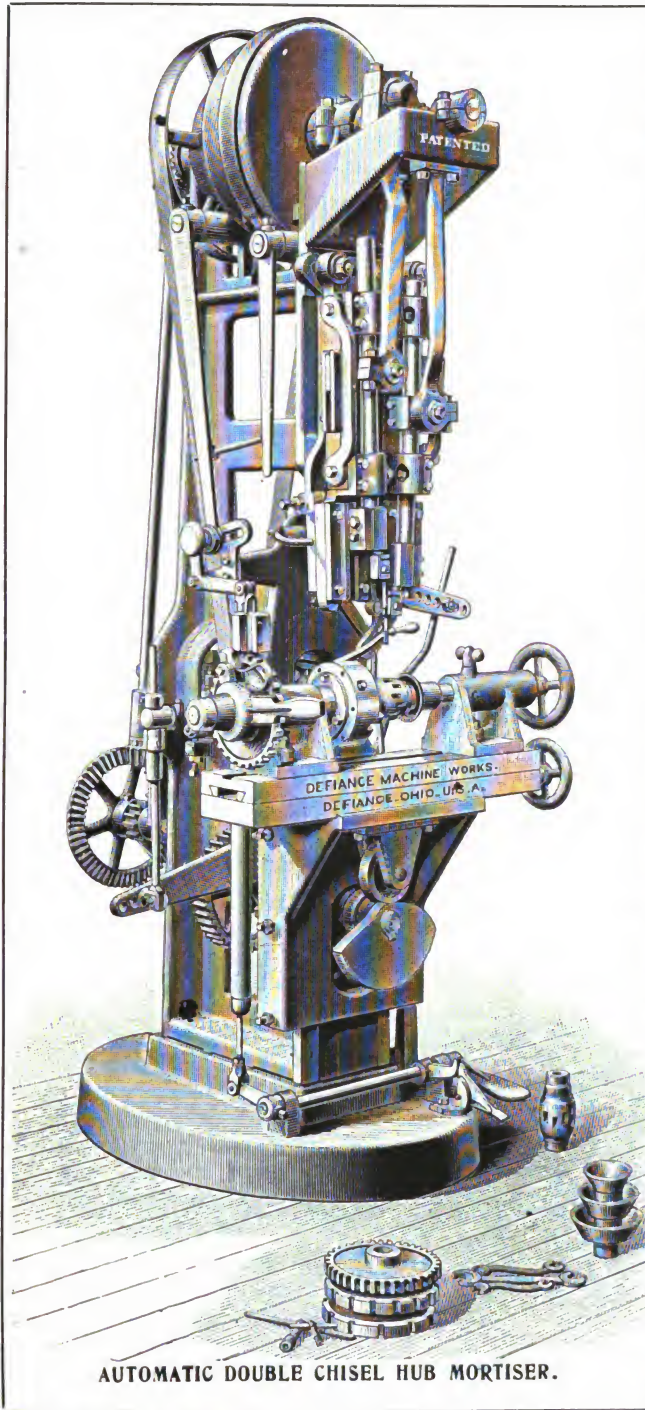
SPOKE AND HANDLE POLISHER.



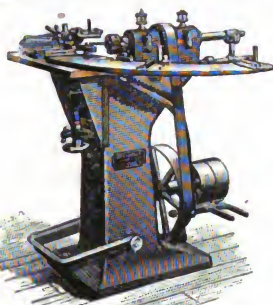
RIM PACKING TABLE.



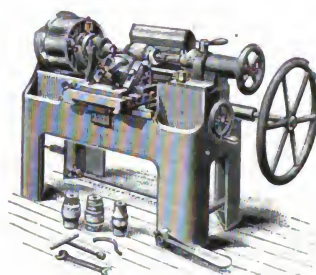
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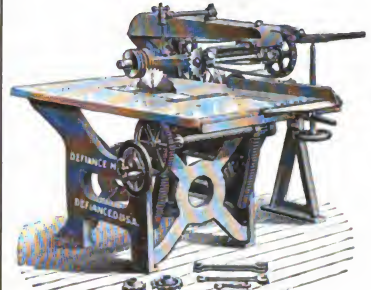


RIM BORING MACHINE.

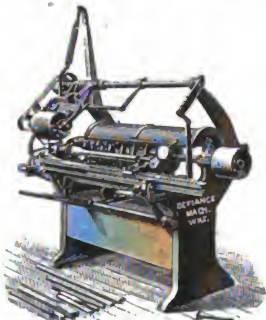


No. 0 HUB LATHE.

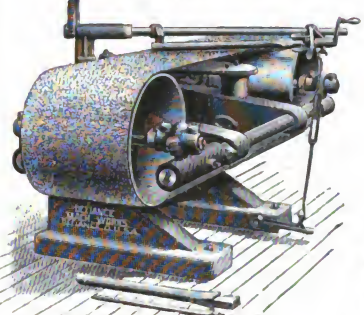
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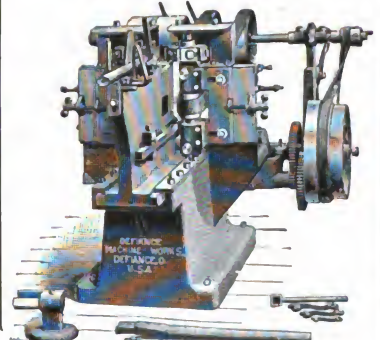
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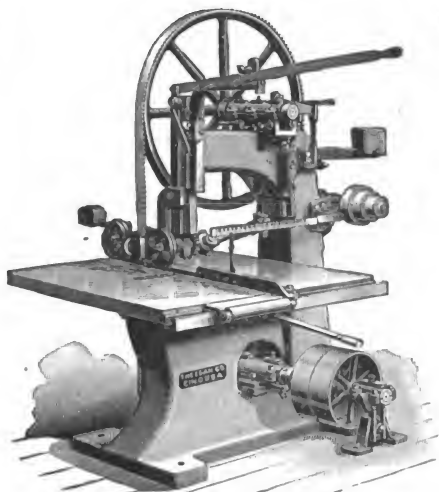
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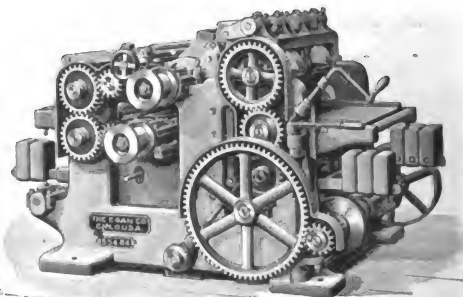
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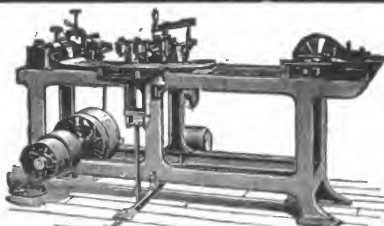
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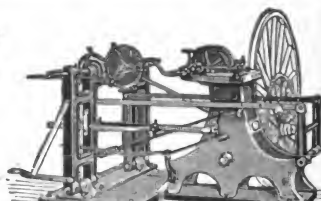
CINCINNATI, OHIO.



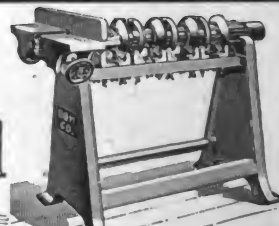
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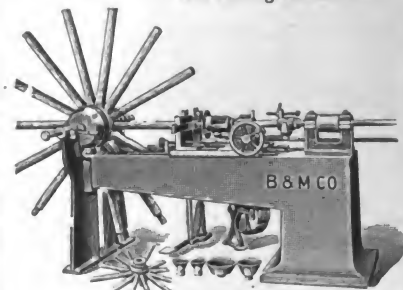


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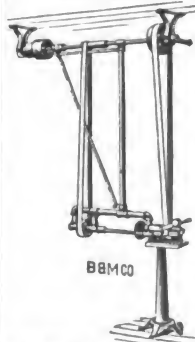


IMPROVED WHEEL, HUB-BORING
AND BOXING MACHINE.

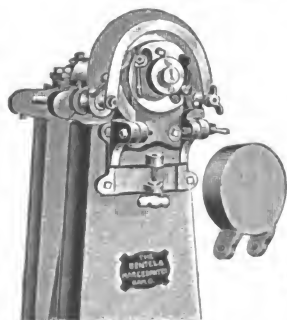
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MANUFACTURERS OF
WOOD WORKING MACHINERY.
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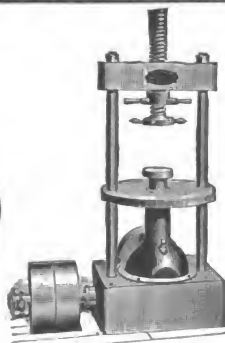
HEAVY GIANT WHEEL TENONER.



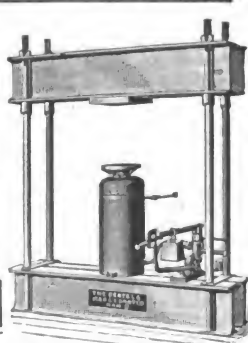
Hub Band Grinding and
Polishing Machine.



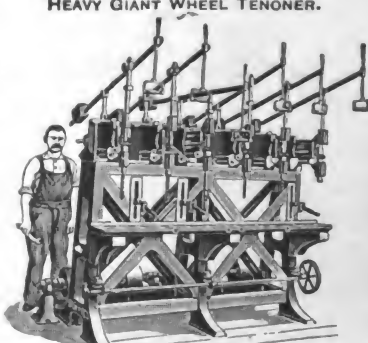
Top of Felly-Rounding Machine.



Improved Cam Press.



Hydrostatic Wheel Press.



Vertical Six Spindle Gang Boring Machine.

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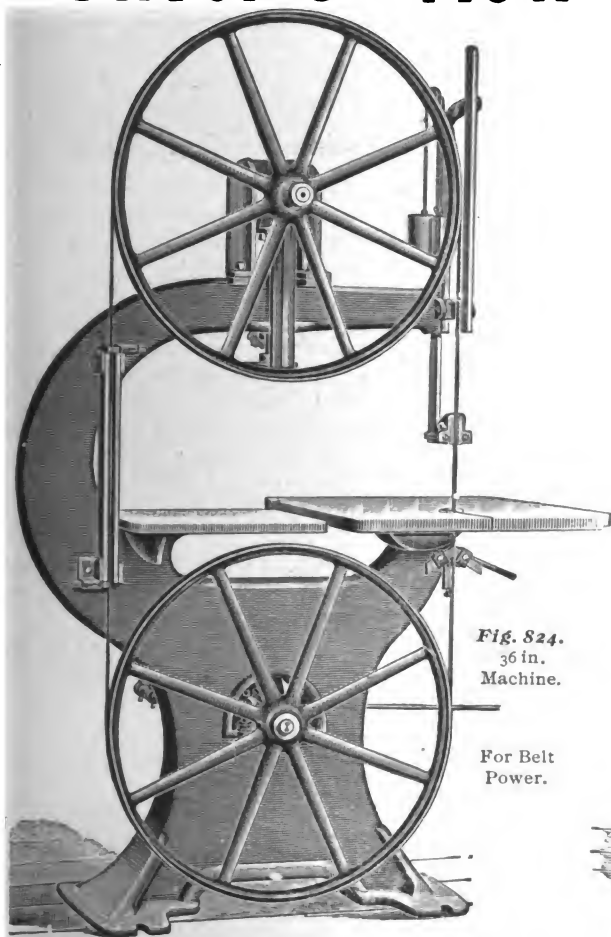


Fig. 824.
36 in.
Machine.

For Belt
Power.

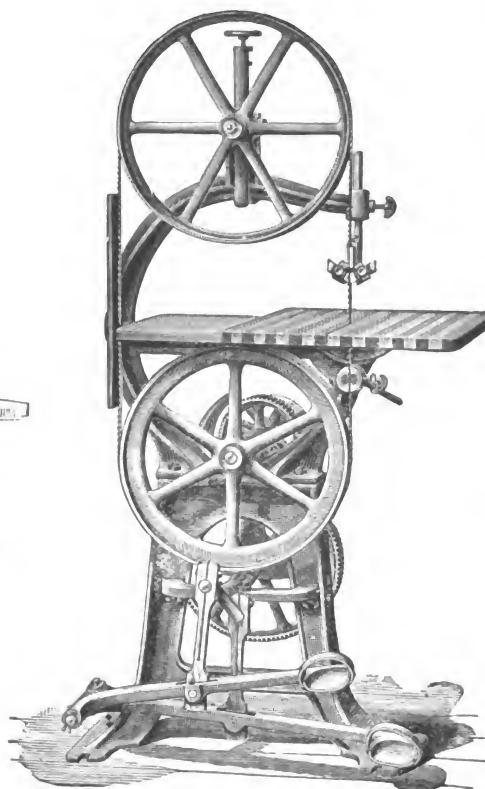


Fig. 721.

30 in. Machine. Combined Foot or Belt Power.

IN SIZES:

20 in. machine for foot or belt power.
26 in. machine for foot or belt power.
32 in. machine for belt power.
36 in. machine for belt power.

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Special Discount to Carriage
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Circular showing all
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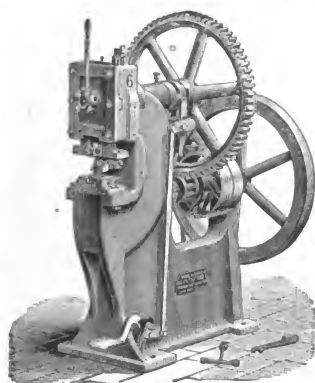
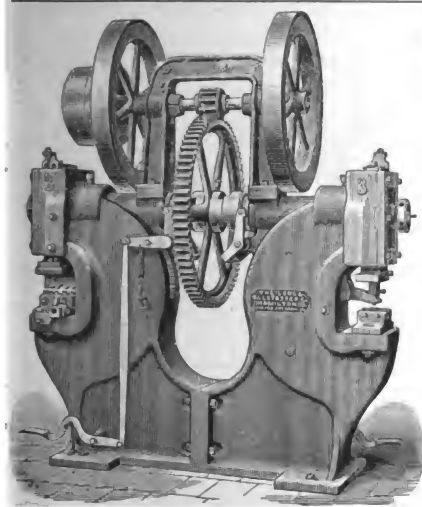
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:FOR....

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...Also make Machinery...

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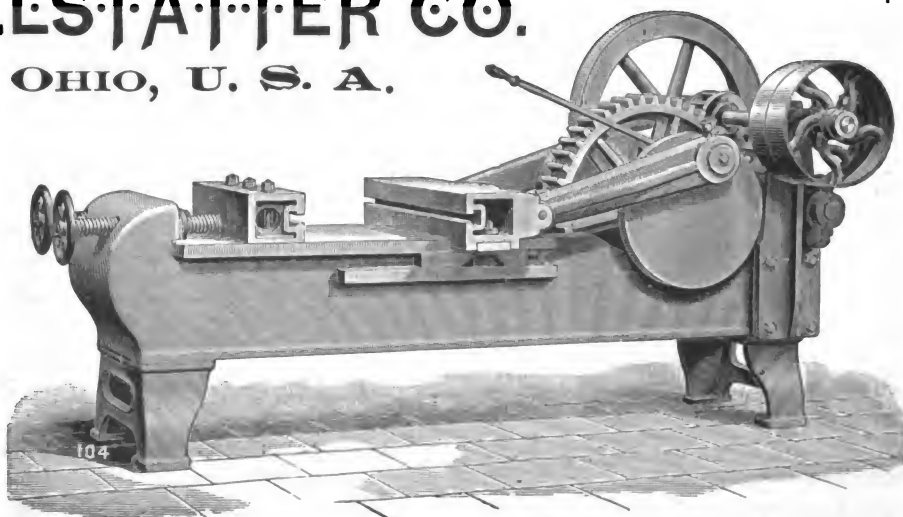
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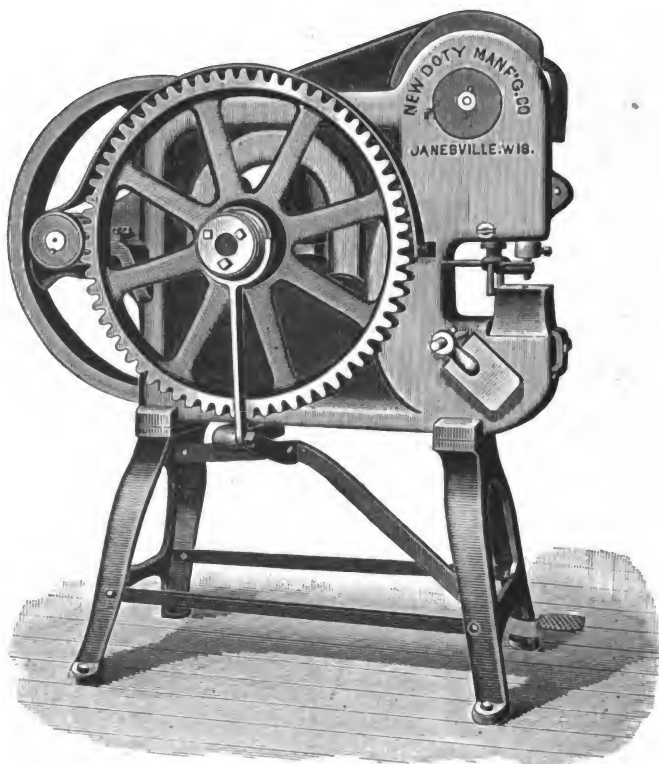
CORRESPONDENCE SOLICITED.



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No. 16 C. PUNCHING MACHINE.

NEW DOTY MANUFACTURING CO., JANESVILLE, WIS.

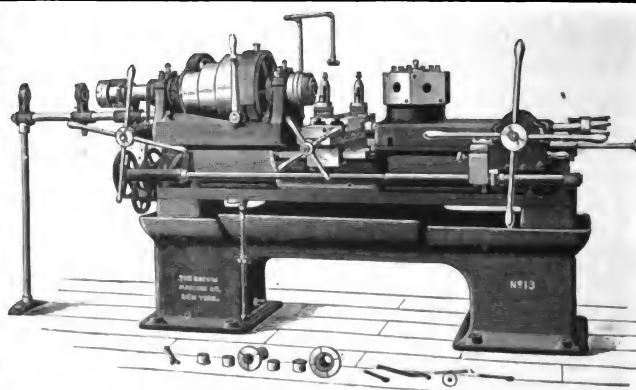
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Hubs and Spokes

HIGH GRADE STOCK
A SPECIALTY.

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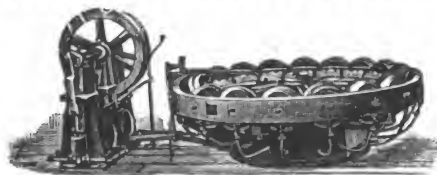


No. 13 SCREW MACHINE, WITH WIRE FEED. GEARED FRICTION HEAD AND POWER FEED TO TURRET.

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PHILADELPHIA STORE,
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Pontiac Spring & Wagon Works, Pontiac, Mich.No. 6

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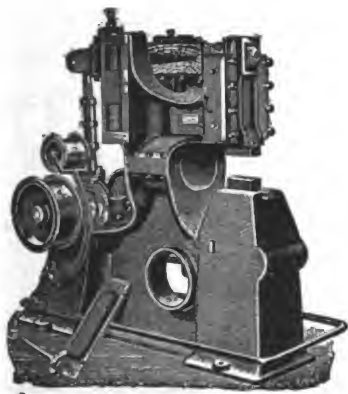
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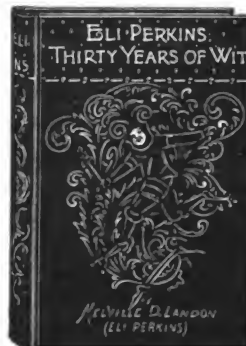
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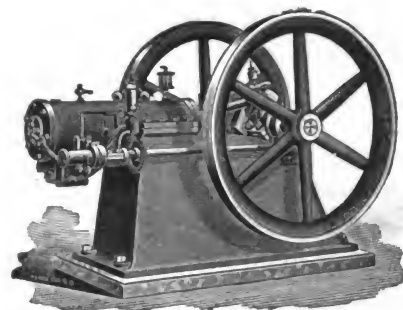
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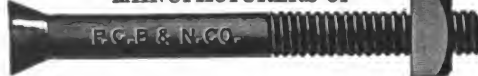
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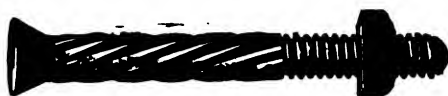
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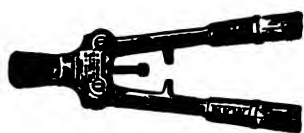
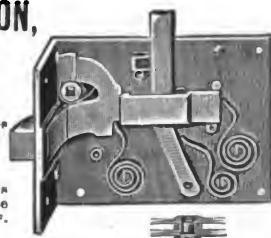
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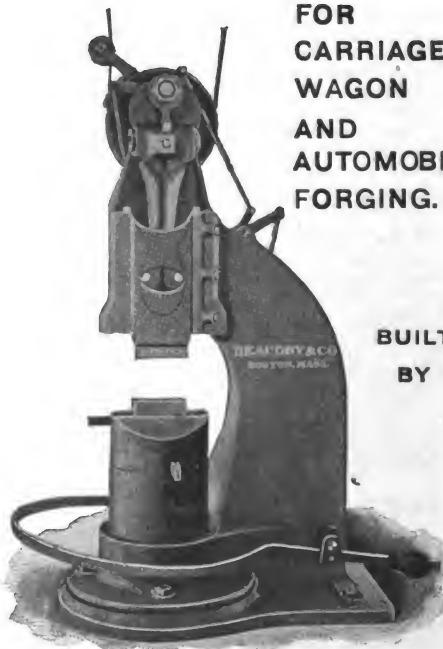
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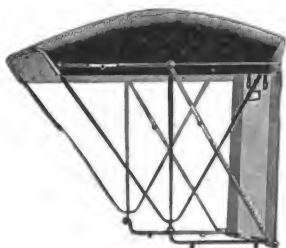
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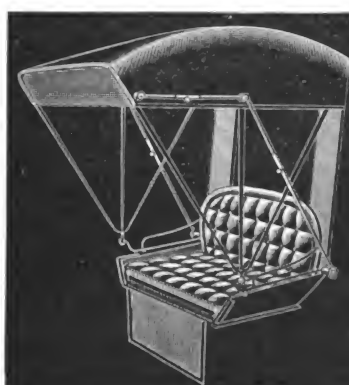
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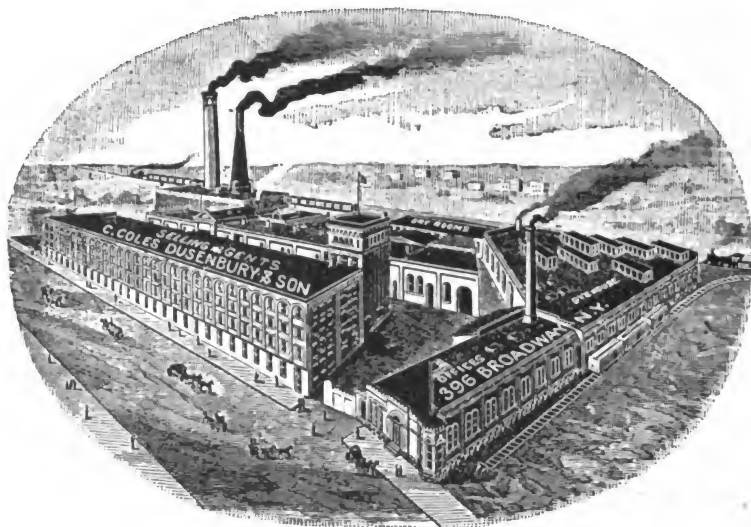
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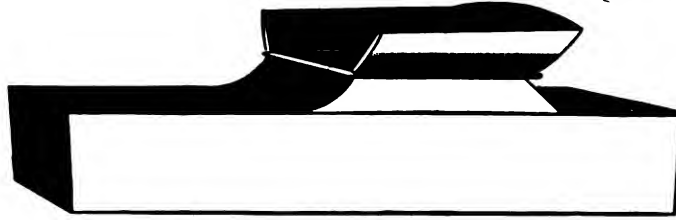
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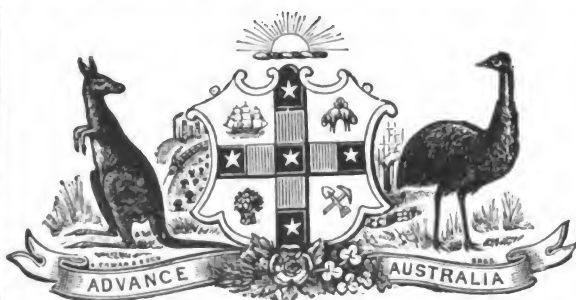
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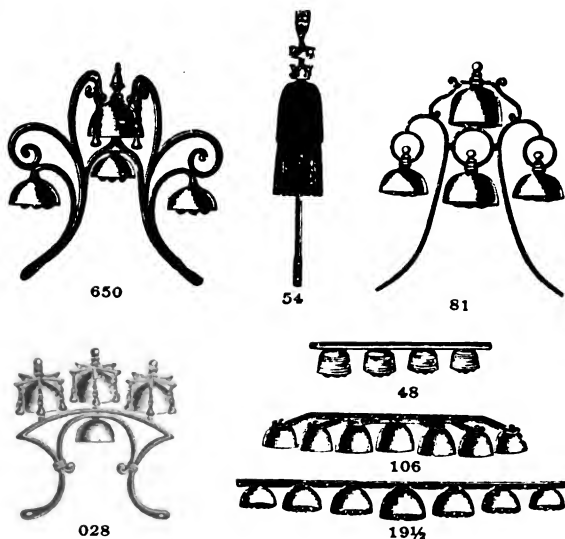
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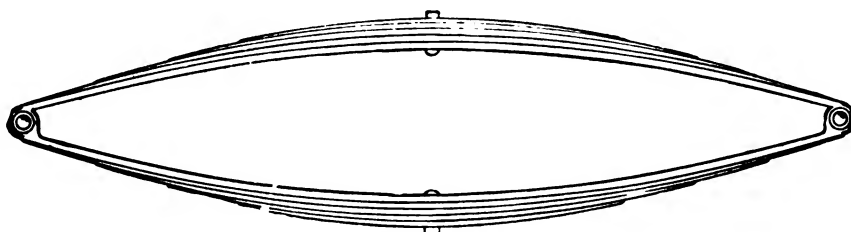
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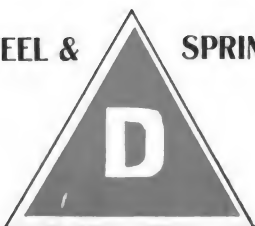
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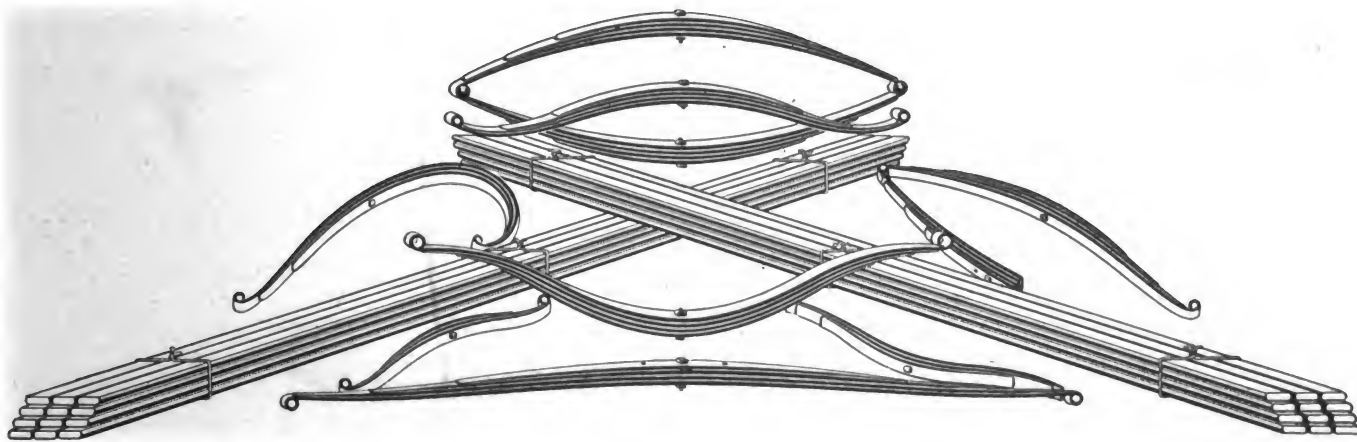


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HOUSES, GARRIAGES,
CARS, IMPLEMENTS, ETC.

MAY WE SEND YOU A DESCRIPTIVE LIST OF
OUR STANDARD GOODS AND QUOTE YOU
ATTRACTIVE PRICES—OR, IF YOU REQUIRE
VARNISHES TO MEET SPECIAL REQUIRE-
MENTS, WHY NOT WRITE US WITH A VIEW
TO OBTAINING HIGHER QUALITY OR
LOWER PRICE THAN YOU ARE GETTING,
OR BOTH?



HARRISON BROS. & CO., Inc.,
White Lead, Colors, Paints, Varnishes & Chemicals,
35TH AND GRAYS FERRY ROAD,
PHILADELPHIA.
27 LAKE STREET, CHICAGO. 117 FULTON STREET, NEW YORK.



A Good Black

at a low price is a very difficult article to get. We have one in our

"Monogram Drop"

put up in 5 or 10 pound press cans, like cut, at

16cts. per pound, net.

Also Colors, Brushes, Pumice Stone, Rubbing and Rotten Stone, Sponges, Chamois, Rubbing Felts.

GENERAL WESTERN AGENTS FOR
BUEHNE'S STEEL WOOL

Takes place of Sandpaper and Pumice. Samples and Price List for the asking.

BRUSHES.

We make a specialty of Brushes for Carriage and Wagon Makers.



Send for our Net Price List of Carriage Painters' Materials and Supplies mailed on application.

GEO. E. WATSON CO.,
Paints, Oils, Varnishes, Brushes, Painters' Supplies and Artists' Materials, Carriage Painters' Specialties.
38 EAST RANDOLPH STREET, CHICAGO.

Wholesale Agents for Eureka Rubbing Stone.

The Hub

"RED SEAL" COACH AND CAR COLORS

ARE ABSOLUTELY THE FINEST MADE.



WE take pleasure in furnishing samples of the colors we make, so that the consumer may be convinced of the richness and tone of our colors before purchasing.



DETROIT WHITE LEAD WORKS, DETROIT. CHICAGO.
BUFFALO. MEMPHIS.

WHY USE SANDPAPER?

1. When you can get the same results in just **ONE-HALF THE TIME** by using Steel Wool?
2. When you can save just **ONE-HALF** the labor by using Steel Wool?
3. When you can do the same job **MORE EASILY** by using Steel Wool?

USE
BUY
TRY

STEEL WOOL.

It cuts more quickly and more uniformly than sandpaper, does not clog or "gum up," and adapts itself readily to the shape of carvings, mouldings, etc., etc.

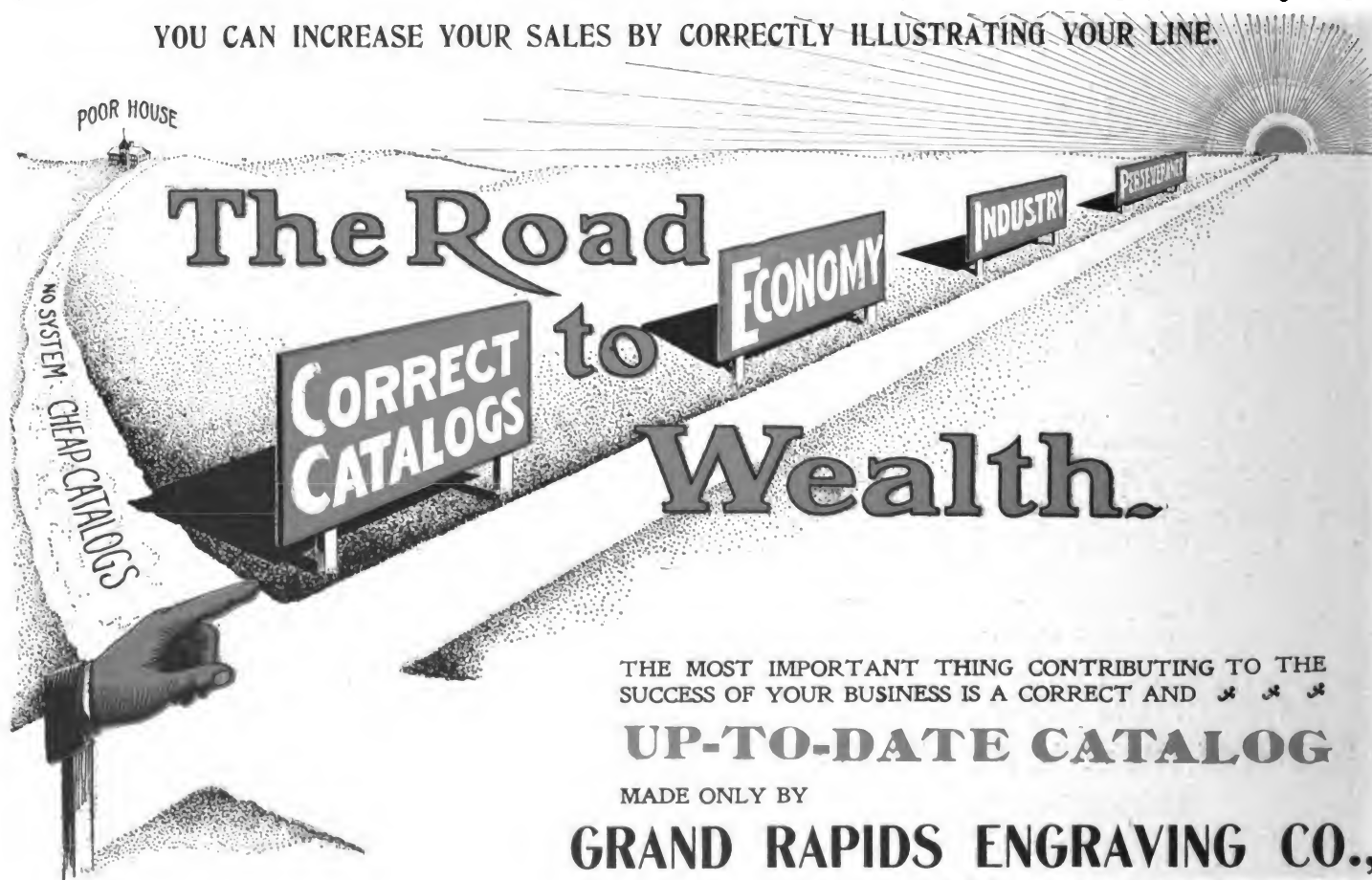
Steel Wool is very light, but exceedingly durable, and in corners or cornices, and on mouldings where sandpaper is used only with the greatest difficulty, labor and expense of time, Steel Wool does the work easily, with little labor, and in just one-half the time. Special Discounts to Consumers for Large Quantities. Write for Quotations.

BUHNE STEEL WOOL CO.,
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W. P. FULLER & CO., Pacific Coast Agents, - San Francisco.
GEO. E. WATSON CO., Chicago Agents,
38 Randolph Street, Chicago.

DON'T CONDEMN YOUR GOODS WITH POOR ILLUSTRATIONS.

YOU CAN INCREASE YOUR SALES BY CORRECTLY ILLUSTRATING YOUR LINE.



THE MOST IMPORTANT THING CONTRIBUTING TO THE SUCCESS OF YOUR BUSINESS IS A CORRECT AND

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MADE ONLY BY

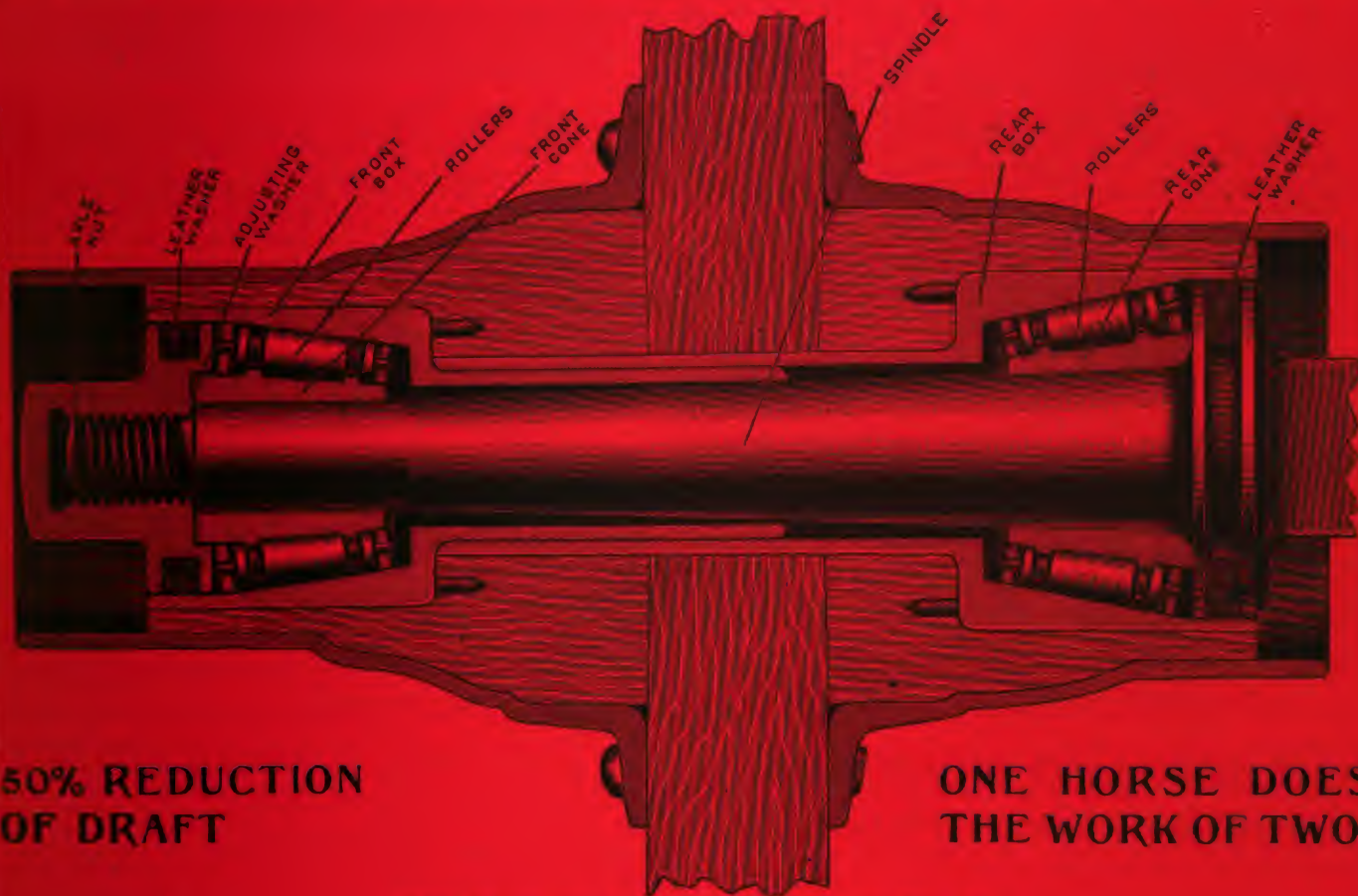
GRAND RAPIDS ENGRAVING CO.,
GRAND RAPIDS, MICH.

SEND FOR SAMPLES.

MODERN CARRIAGE ENGRAVERS AND PRINTERS.

Please mention "The Hub" when you write.

TIMKEN ROLLER BEARING AXLE



50% REDUCTION
OF DRAFT

ONE HORSE DOES
THE WORK OF TWO.

Patents, 606,635, June 25th, 1898. No. 606,636, June 25th, 1898.

INSTRUCTIONS FOR PUTTING WHEELS ON:

*Slip rear cone on spindle,
Put wheel on,
Slip front cone on spindle,
Screw up axle nut tight,
Drive off.*



FRONT CONE AND ROLLERS.



REAR CONE AND ROLLERS

Simple, isn't it?

We Fully Guarantee the Axles to be Perfect in Every Particular.

SEND FOR CATALOGUE AND PRICES.

TIMKEN ROLLER BEARING AXLE CO.

HENRY TIMKEN, President,

2d and Branch Streets,

ST. LOUIS, MO.

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SHORT CUT MILL TO RETAIL.

FROM MILL DIRECT TO RETAILER.



TRADE MARK
REGISTERED



NORTHERN OHIO BLANKET MILLS,
Largest and Best Equipped in the World.

IF THIS IS MISSING FROM ECLIPSE, J. I. C.,
MONITOR BLANKETS, THEY ARE CHEAP
IMITATIONS.

OURS ARE ALL WOOL—50 PER CENT. BETTER.

WE LEAD THE MARKET WITH

Golden Fleece Fawn, Scarlet Borders.	Beautiful Color, Lofly Nap. Outsells all others.
Greenland, Scarlet Borders.	Fast Dark Green. Attractive, Quick Seller.
Guy, Scarlet Borders.	Fast Blue, Best in Class. Thoroughly Reliable.
XX. Greenland, no Borders	Fast Dark Green. High Class, Moderate Price.
Black Diamond, no Borders.	Fast Black. High Class, Moderate Price.

All Wool Fawns—Dark Greens, Blues, Blacks.

Largest Line of All Wool } New, Bright, Stylish.
and Fancy Plaids. } Fair Priced.

Natural Gray Staples—Wool, Wear for Ever.

Full Weight, Sizes and Values, Fast Colors.

SEND FOR CATALOG.

THE BECKMAN CO.,
CLEVELAND, OHIO.

CAUTION.

THERE will be 20,000 BIKE WAGONS built and sold in 1900. One-half of these will be high-grade work, equipped with first-class guaranteed tires. The balance will be medium-grade work, equipped with light construction, low-grade tires, unbranded, or branded with a single name backed up by a supposed guarantee, printed on a slip of paper, pasted on seat of wagon, the provisions of which read: Not responsible for punctures, stone bruises, rim cutting, etc. The above clause represents 95 per cent. of all troubles, consequently guarantee is misleading. High-grade heavily constructed tires withstand these troubles, although rim cutting is entirely the fault of the driver. The tire is either not inflated sufficiently, or leaks for one cause or another, and should be attended to immediately. We are making only the Diamond Single Tube Pneumatic Carriage Tires, bearing brand like cut shown. We know this tire is made with a knowledge of the demands, and we are prepared to back it up regardless of expense.



Made in Akron, Ohio, by

THE DIAMOND RUBBER CO.

Please mention "The Hub" when you write.

Varnish Troubles and Color Kinks.



May be avoided by
using the best goods
on the market.

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FELTON, SIBLEY & CO.,

Makers of High Grade Varnishes
and Superfine Colors.

136-140 North 4th Street,
PHILADELPHIA.

PURE WHITE, CLEAR TINTS, ENDURING COLORS.

Can be obtained only by the use of Zinc White.
Zinc White remains white, is unaffected by ammonia
or sulphur vapors, and has no effect upon the most
sensitive colors.

Lasting work requires Zinc White.

THE NEW JERSEY ZINC CO.,

No. 71 Broadway, NEW YORK.

FREE: Our Practical Pamphlets:

"The Paint Question."

"House Paints, a Common Sense Talk About Them."

C.A. WILLEY'S CARRIAGE PAINTS.

SEND FOR DESCRIPTIVE LIST

C.A. WILLEY, HUNTERS' POINT, NEW YORK, N.Y.

THE

SOLE AGENTS IN U. S. FOR
NOBLES & HOARE'S
— FAMOUS —
ENGLISH VARNISHES

Japan Gold Size,
Rough Stuff
BEST DRY AND READY MIXED.

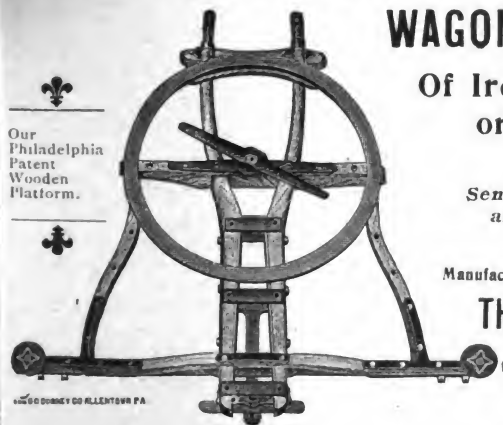
POMEROY & FISCHER, NEW YORK
28 & 30 FRANKFURT STREET.

IMPORTERS
OF
THE BEST
OF
English
WHITE LEAD
ESPECIALLY SUITED FOR
CARRIAGE WORK.

Genuine English Vermillions,
Cadmium and Perfect Yellows,
and other Fine Coach Colors.
Japan Colors, Bronze Powders, Etc.

EVERY-THING

BEST PLATFORMS AND COMPLETE WAGON GEARS.



Our
Philadelphia
Patent
Wooden
Platform.

Of Iron, Steel
or Wood.

Send for Catalogue
and Price List.

Manufactured by

**THE ALLENTOWN
PLATFORM CO.**
ALLENTOWN,
PA., U. S. A.



Wood Cut and Electrotpe Cabinet.

PATTERN LETTERS

E For Iron and Brass Castings. Various Styles and Sizes. **E**

Leather and Wood FILL-
ETS for Patterns.

Send for Descriptive
Price List. Please
mention **THE
HUB.**

A.G. BUTLER,
101 Beekman St.,
New York.

Please mention "The Hub" when you write.

Carriage Painters

Do You Know Us?

Do You Know Our Product?



*What do You Think of It?
Have You Given It a Trial?*



HAVE you seen our new Catalogue G, and are you familiar with the line of Panel Ornamentation that we are supplying to the trade? Do you know that it is to your interest to keep in touch with us? We are getting up new schemes for Ornamentation constantly, and what we get up are new and not the old, antiquated, out of date, 50 years behind the times, ridiculously mixed up style of colors, formerly furnished by the foreign importers. Our designs are new and up to date, as well as original style of ornamentation. It is foolish for you to spend fifty cents or a dollar for decorating that can be done for 15 per cent. or 20 per cent. of that cost and can be done much better at that.

Do not assume that we are trying to sell you these old styles. Do not take anything for granted. Write us for our catalogues and samples, which are free for the asking. We not only have these panels but other work of that character, as well as delicate scroll ornamentation, such as you see on the highest grade vehicles. Does it not appeal to your reason that when twelve short months ago we were not known in the field, and in that short period we have worked up a business of \$100,000 per year, there must be merit in the product?

Orders for special designs, whether for the vehicle or any other industry, receive prompt attention.



THE MEYERCORD CO., INC.,

American Manufacturers

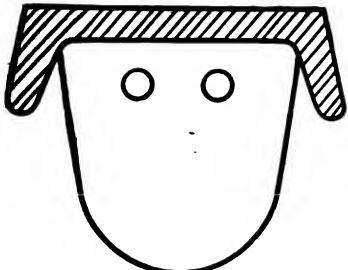
Guaranteed Decalcomania Transfers.

NEW YORK OFFICE,
805 St. James Building.

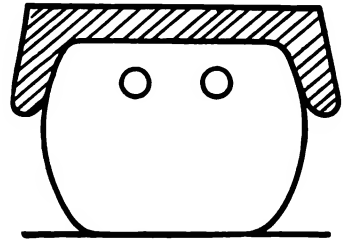
MAIN OFFICE, Chamber of Commerce,
CHICAGO.

Langmuir's Patent Improved Solid Rubber

CARRIAGE TIRE



NORMAL



UNDER LOAD

This tire does not open at the joint and consequently it does not require compression; does not creep; does not cut out at the

base; does not split or scalp; all on account of the V-shaped space between the tire and the flanges. We supply the trade with all sizes from $\frac{3}{4}$ to 2 inches inclusive. We furnish a complete outfit for applying all sizes, $\frac{3}{4}$ to 2 inches.

PUT THEM ON IN YOUR SHOP IN THE REGULAR CHANNEL IRON IN USE

REVERE RUBBER CO.

Sole Manufacturers, 59 & 61 Reade St., New York

THE CLARK VALVELESS
Pneumatic **TIRE.**



WITHOUT A VALVE

For Carriages and Automobiles.

No Valve Stems to tear away. No Lugs or Bolts to work loose and cause troublesome leaks.

THE CLARK VALVELESS has many other points of superiority over the ordinary pneumatic tire with the valve, that are fully described in our new illustrated catalogue, which we send you free on request.

CLARK CYCLE TIRE CO.,
SOLE MANUFACTURERS OF
THE CLARK VALVELESS,
EQUITABLE BUILDING, BOSTON, MASS.

SAMPLE J.F.

SPECIALTIES FOR AUTOMOBILES



...ALL KINDS OF...

Lamps, Silver Handles, Door Handles, Sash Fasteners, Concealed Key Holes, Sash Knobs, Front Toe Board Steps, Silver Molding, Rubber Head Tacks, Special Hexagon Nuts and Collars, Etc. (Samples sent on request.)

...MANUFACTURERS OF...

CARRIAGE HARDWARE AND SPECIALTIES
FOR ALL VEHICLES.

Corner Irons, Pray's Apron Fasteners, "Excelsior" Curtain Fasteners, Cloth and Japan Buttons and Nails.

SEND FOR No. 11 LAMP CATALOGUE.

G. COWLES & Co.,
NEW HAVEN, CONN.

Please mention "The Hub" when you write.

THE GOODYEAR "WING" TIRE

Patented April 25, 1899. No. 623,703.

WARRANTED Highest in Quality,
Best in Service,
Longest Life,
OF ANY SOLID TIRE ON THE MARKET



SEE THAT WING?

...IT...

PREVENTS

CUTTING OR CHAFING
ON CHANNEL.
DIRT OR WATER FROM
GETTING UNDER TIRE.
CREEPING.

*We furnish a simple and effective machine
for applying tires to wheels.*



200 MANUFACTURERS & DEALERS

NOW USING OUR TIRES, UNQUALIFIEDLY ENDORSE
ABOVE.



The Goodyear Tire & Rubber Co.,
AKRON, OHIO, U. S. A.

WRITE FOR PARTICULARS



The illustration features a green, rounded rectangular background. Inside this background, there is a cross-section of a tire showing a hole. A patch is being applied to the hole, with a small tool (a patching iron) shown above it. The patch and the tool are labeled "STAR BRAND". To the right of the main green area, there is a smaller illustration of a patch and a tool, also labeled "STAR BRAND". Below the green area, the text "BATAVIA RUBBER TIRE CO." is written in a large, bold, sans-serif font. Below this, there is a paragraph of text in a smaller font. At the bottom, the company name "Batavia Rubber Tire Co., BATAVIA, N. Y." is written in a bold, sans-serif font.

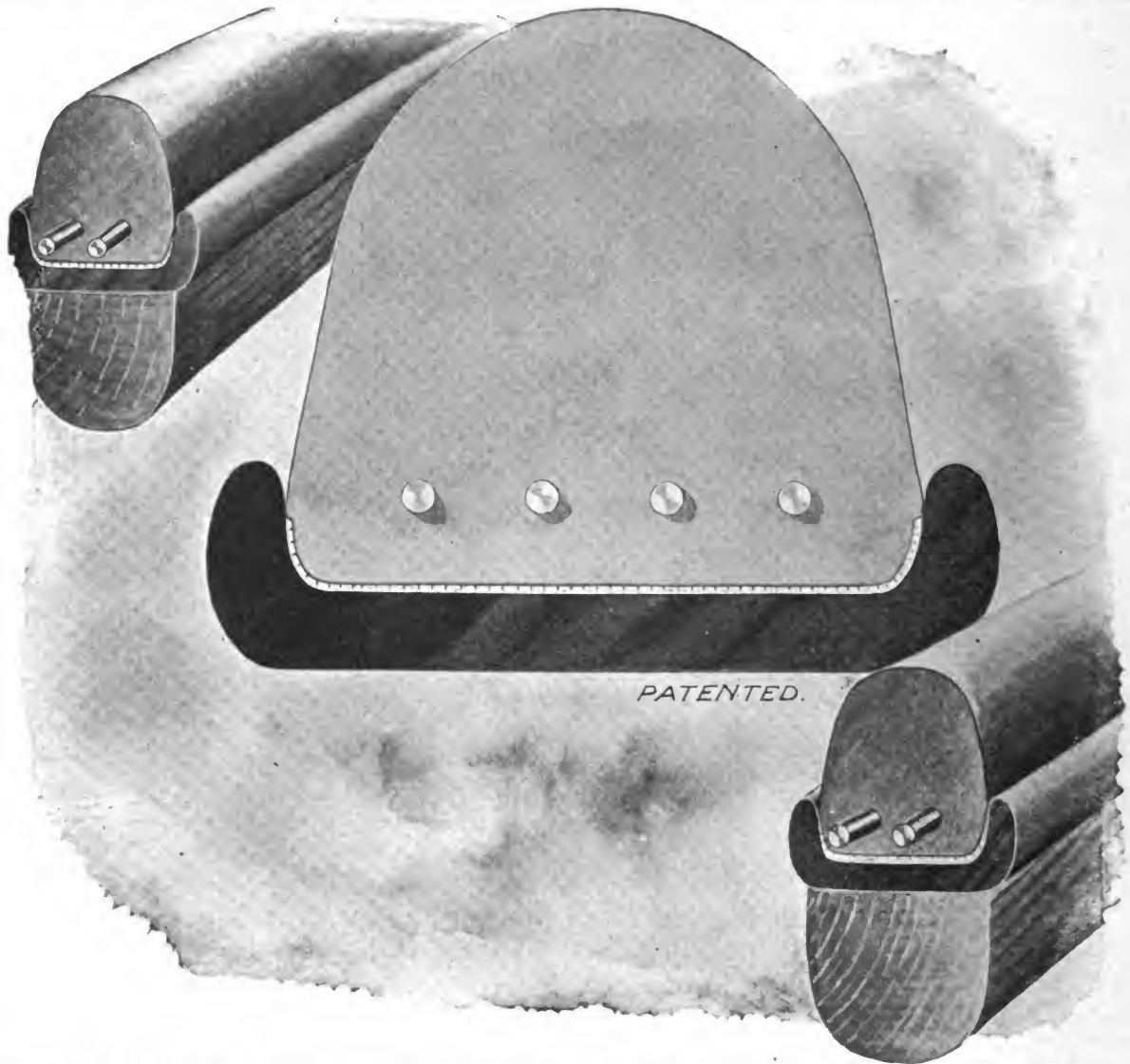
BATAVIA RUBBER TIRE CO.

If you want the best in Rubber Tires buy our "Star Brand." We only ask a trial to prove this. We furnish at small cost complete outfits and full instructions with which they can be applied in your own shop. Write us for samples and prices. You will find our proposition worthy of your earnest consideration.

Batavia Rubber Tire Co.,
BATAVIA, N. Y.

BE PROGRESSIVE....

AND INSIST ON HAVING YOUR VEHICLES EQUIPPED WITH



Kelly Springfield Tires.

IF A CARRIAGE MANUFACTURER, AND NOT ALREADY SUPPLIED, SECURE ONE OF OUR TIRING PLANTS AND HAVE THE SATISFACTION OF GIVING YOUR CUSTOMERS VALUE RECEIVED. LET US SEND YOU FOLDERS TELLING ALL ABOUT THEM. * * * * *

Consolidated Rubber Tire Co.

40 WALL ST., NEW YORK and AKRON, O.

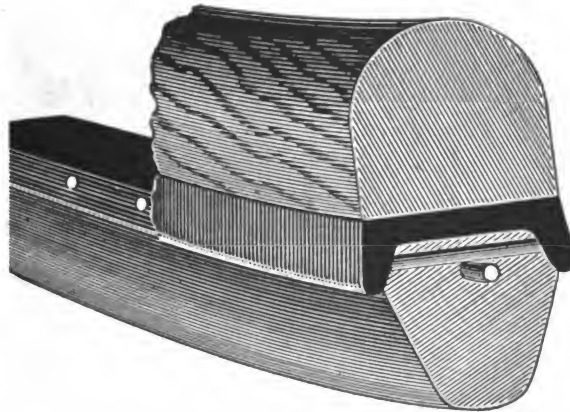
Please mention "The Hub" when you write.

MANUFACTURERS, BE PREPARED
FOR
"WEMAKA" RUBBER TIRE
(IT IS HERE.)

You want it—there is nothing like it.

APPLIED WITHOUT AN EXPENSIVE PLANT

and the simplest of construction commends it to all practical carriage builders * * *



THIS TIRE STAYS

in the channel, where it belongs, and the

CROSS STAYS

prevent the longitudinal (or retaining) wire from cutting through the tire. *

A sample of the rubber, SHOWING CROSS WIRES, will be sent upon application.

"WEMAKA" RUBBER TIRE CO.

346 Wabash Avenue,

CHICAGO, ILL., U. S. A.

SALES DEPARTMENT.



International
TIRES.



If you are building a thoroughly first-class line of carriage work it pays to put on high-grade tires. All solid rubber tires list the same, but many of them weigh only twelve ounces to the pound, and some even less. THE INTERNATIONAL IS A FULL WEIGHT TIRE, of large cross section, weighs sixteen ounces to the pound, and is made of REAL RUBBER. If you want your money's worth, get

♦♦♦♦ International
Solid Rubber Tires.....

If you are in the market for Pneumatic Vehicle Tires write for quotations. INTERNATIONAL PNEUMATICS are made of the right sort of material and in the right sort of manner to give results. When you pay your money for tires you want good results. We are making good results every day in our factory.

INTERNATIONAL A. & V. TIRE CO.,

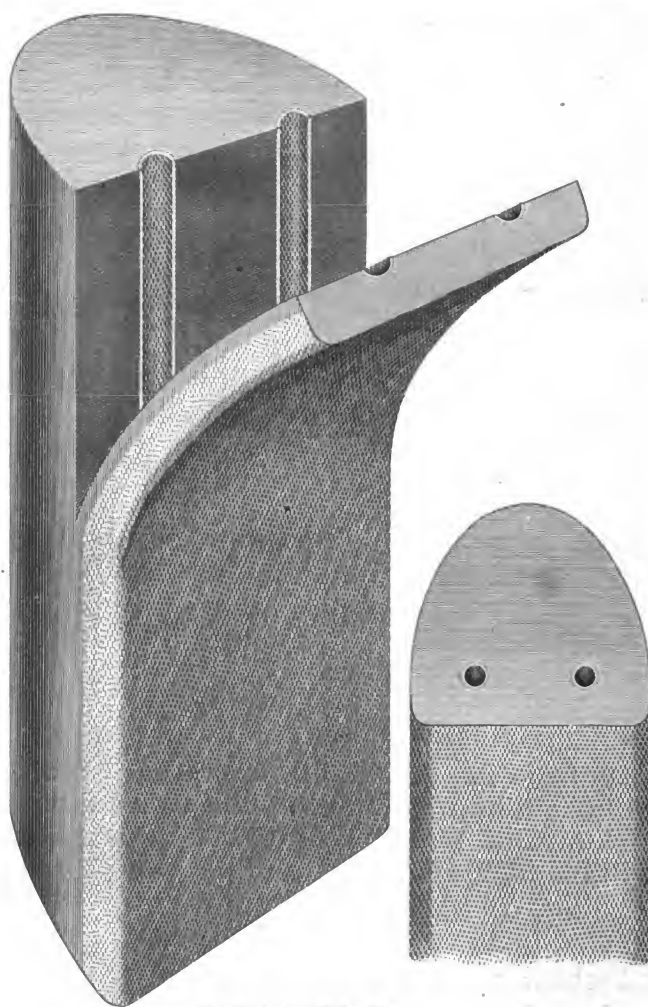
346 Broadway,
NEW YORK CITY.



Please mention "The Hub" when you write.

The Reason Why THE **VICTOR** TIRE

*Wears
longer
than
any*



*Other
is
because
of its*

Patented, July 23rd, 1895.

Insulated Wire Cavities

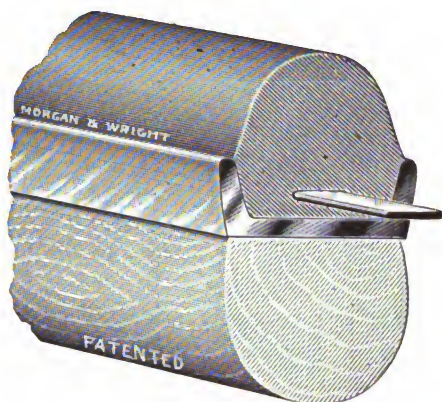
.....
THE VICTOR RUBBER TIRE CO.,
SPRINGFIELD, OHIO, U. S. A.

New York, - Boston, - London, - and Branches.

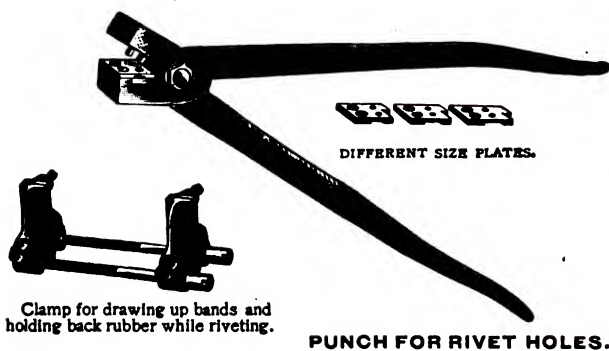
Please mention "The Hub" when you write.

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

THE
MORGAN & WRIGHT
SOLID
RUBBER
VEHICLE
TIRES

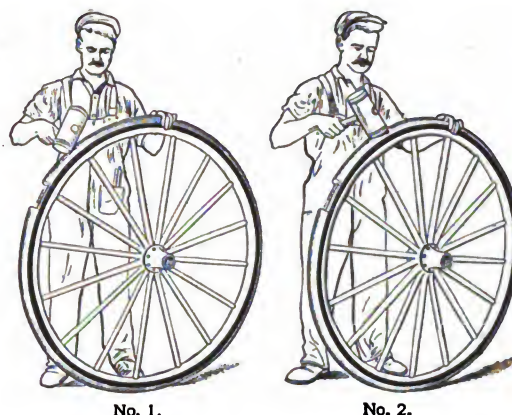


Are Fastened In the Channel by Means of a Steel Band.



With this set of tools (which we furnish at nominal cost) and an ordinary vise, any mechanic can fasten them on.

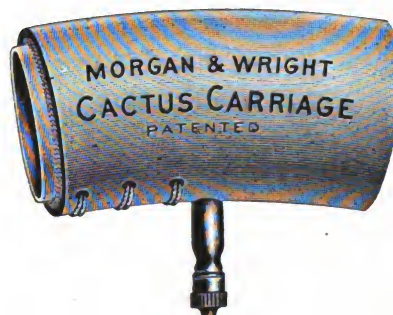
We furnish channels, tires and tools complete.



Cut No. 1 shows the RIGHT way to pound a solid Rubber Vehicle Tire to bring the two ends together after it has been fastened in the rim. Cut No. 2 shows the WRONG way. ALWAYS strike a GLANCING blow, as shown in Cut 1, and NEVER strike a STRAIGHT blow, as shown in Cut 2.



We also make the Cactus Carriage and Pneumatic Carriage Tires in all sizes and diameters. Full information regarding our tires sent on request.



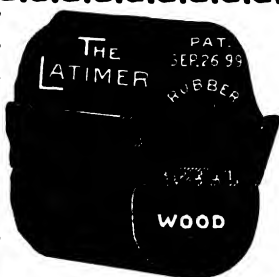
NEW YORK BRANCH:
214-216 W. 47th Street.

MORGAN & WRIGHT
331 WEST LAKE STREET
CHICAGO.

BOSTON BRANCH:
80 Battery March Street.
Near Fort Hill Square.

MORGAN & WRIGHT TIRES
ARE GOOD TIRES

MORGAN & WRIGHT TIRES
ARE GOOD TIRES



RESILIENT

COMPOUND STEEL SPRING

VEHICLE TIRES.



After a test of one year and a half we are pleased to place this Tire before the people. This Tire will take the place of pneumatic tires for vehicles as well as solid rubber tires. It is more resilient than solid rubber, therefore will stand more wear. It will not crack off at the top of the channel like solid rubber tires, as the Compound Steel Springs will keep the rubber from cracking at that point. The two coils of wire are in telescopic (or tubular) engagement with each other and embedded in a body of rubber at a very high pressure, so as to form a solid mass of rubber and springs. We use one wire to fasten the tire to the channel which runs through centre hole. The ends of wire are brazed and the wire drawn tight on bottom of coiled spring gives wide bearing footing and makes it impossible for tire to rock.



WIRE PULLER.

With this Puller, which we furnish, a Blow Torch and Vise, any ordinary mechanic can set our tires.

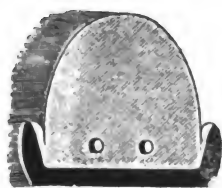
THE LATIMER RUBBER TIRE CO.



CHICAGO,
24 South Clinton Street.

NEW YORK,
15 Platt Street.

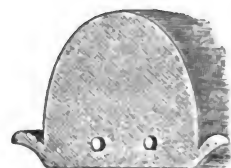
WORKS, HUNTLEY, ILL.



DAVIE & CO.,

Manufacturers and Dealers in

Rubber Goods.



LET US FIGURE
FOR YOUR
TRADE.



1310-1314 Wallace Street,
PHILADELPHIA, PA.

BE WISE AND BUY NOW

THE HANDIEST, BEST,
QUICKEST, CHEAPEST,
AND THE MOST
POPULAR
SHIFTER
on the
Mar-
ket.

WRITE
FOR IN-
FORMATION.

STAR MFG. CO.,
PRINCETON, ILL.

PAT'D
1900.

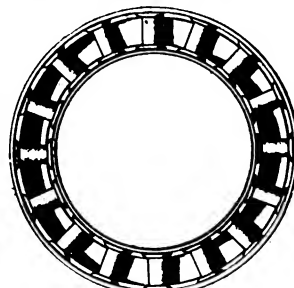
STAR.

THE
BEST
on EARTH

The Bradshaw Spool Roller-Bearing 5th Wheels

FOR
VEHICLES.

Patented in the
United States, Canada
and Europe.



No
Oil.

No
Grease.

**SAVES : 25 Per Cent. on Cost.
50 Per Cent. on Application.**

These are saved over other Patent fifth wheels by using **The Bradshaw Spool-Roller 5th Wheel.**

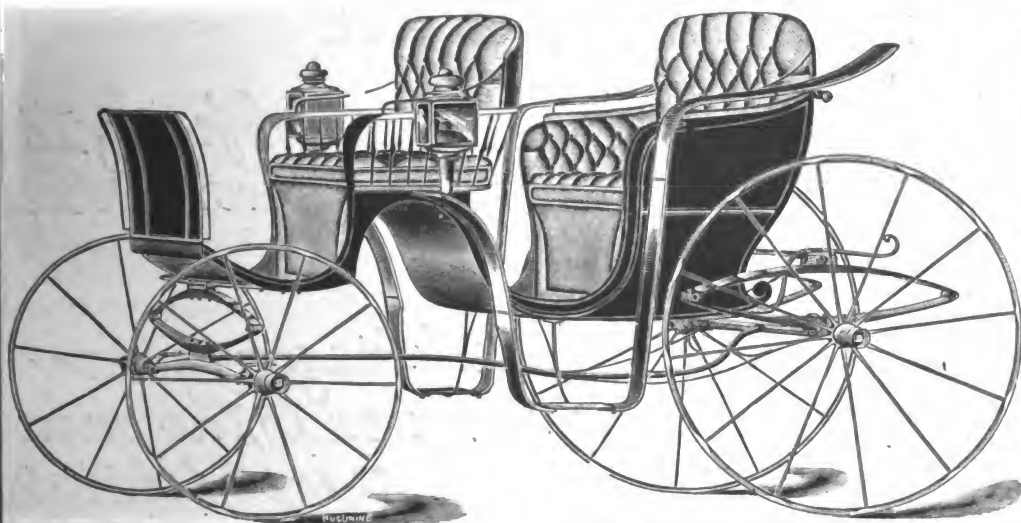
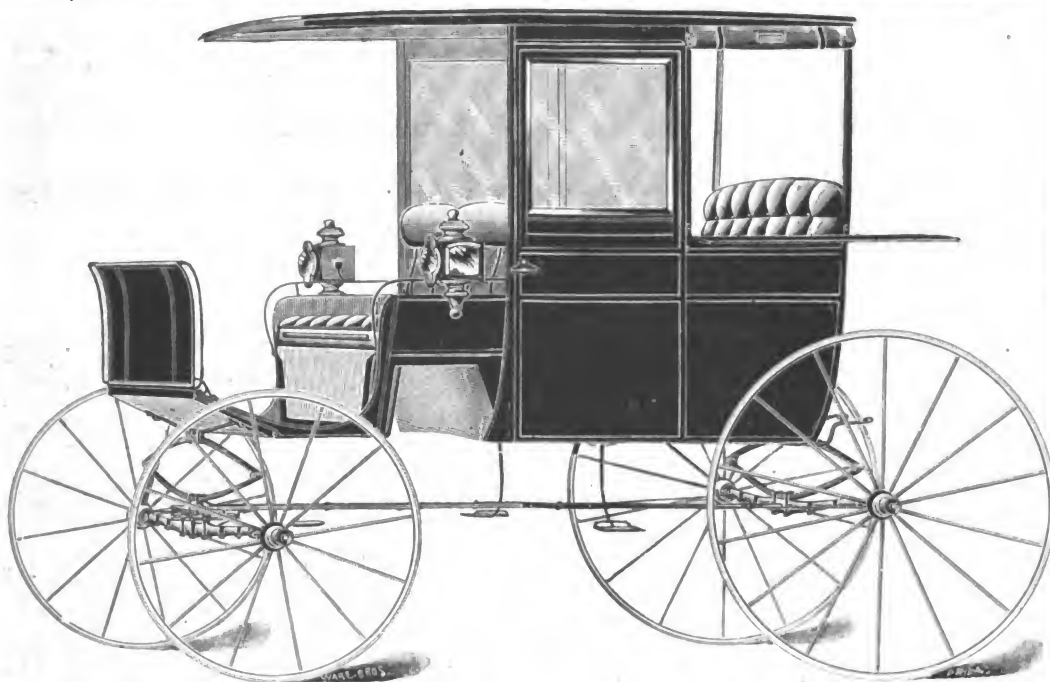
To fit these Spool Rollers to old wagons, the removal of the old wheel is not necessary. This wheel is 100% more durable than any other patent 5th wheel.

SEND FOR PRICE LIST.

THE TURNER MFG. CO., - 245 Broadway, New York.

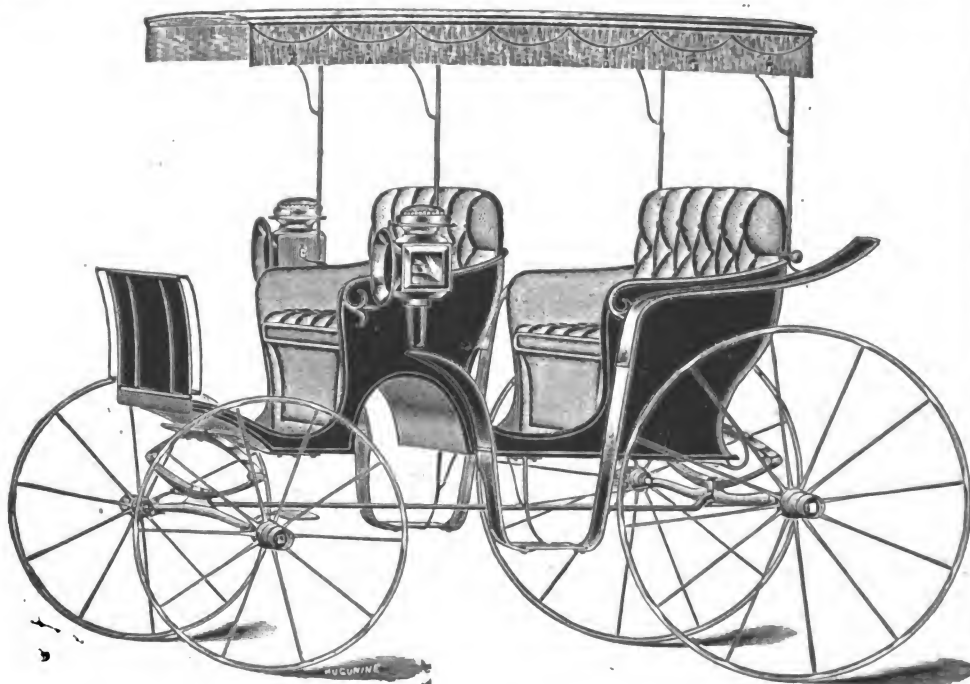
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H. H. 
BABCOCK
COMPANY.



 WOULD LIKE TO
 SEND THEIR NEW
 CATALOGUE TO
 ALL DEALERS
 WHO HAVE NOT
 RECEIVED ONE

 WHEN YOU SELL
 A BABCOCK VE-
 HICLE YOU ARE
 ALWAYS SURE
 OF PLEASING
 YOUR CUSTOM-
 ER. * * * *



H. H. BABCOCK COMPANY, Fine Carriage Builders,
 WATERTOWN, N. Y.

Please mention "The Hub" when you write.

Waterloo Pneumatics.

To The Trade;—

The subject of "Pneumatics" has commanded the earnest attention of progressive carriage builders and dealers during the past season to a remarkable degree.

The conclusion reached by both is that, to be a permanent success, Pneumatic Vehicles must be constructed of the best material, honestly put together.

It is just this combination that we are offering to the dealer who appreciates a good looker, a good seller and a good laster in a Pneumatic.

In The Rex Pneumatic Road Wagon, shown herewith full appreciation of first impressions its unusually pleasing proportion this is the recognition lying principle that lasting friendship is, above all, due to good wearing qualities — nothing but the very best of material is used in any part of this vehicle and it is sold on this guarantee.

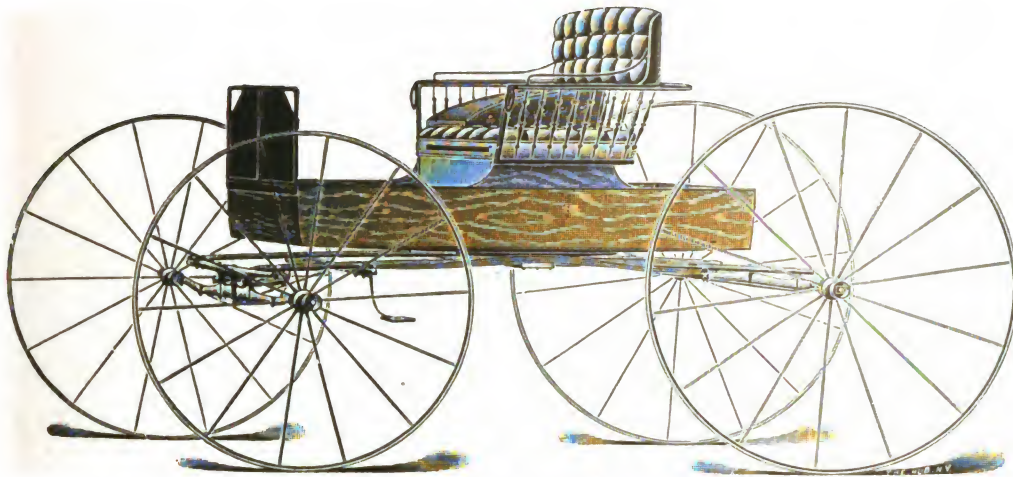


Its price, quality considered, is also very attractive, and we solicit correspondence from prospective buyers believing that the intrinsic merit in the "Rex" will win.

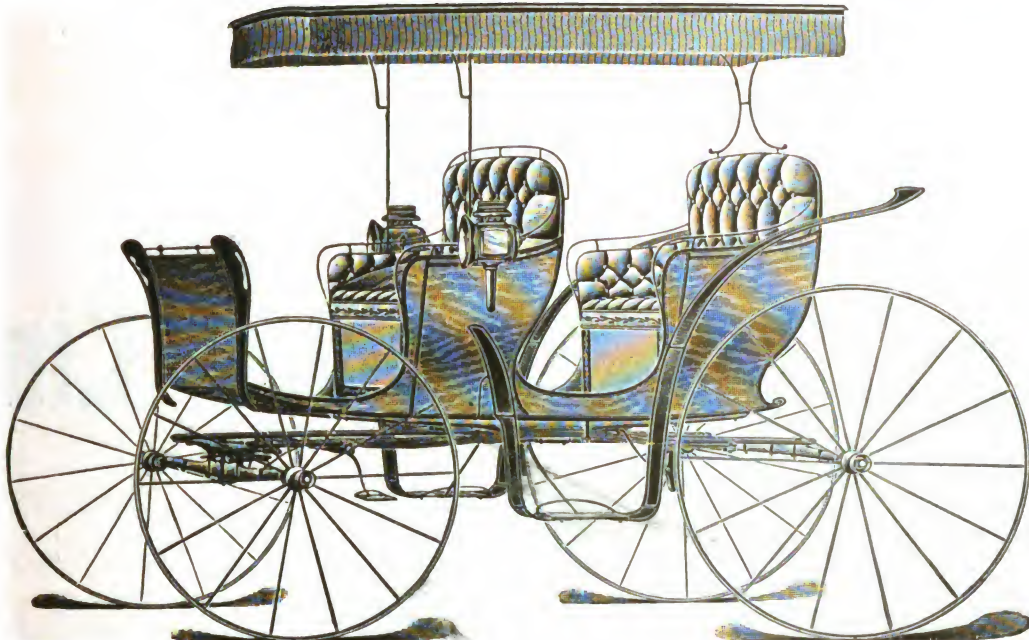
Waterloo Wagon Company Ltd.

Waterloo, N.Y.

In the Construction of Our
GLENS FALLS BUCKBOARD VEHICLES



No. 430. NEWPORT ROAD WAGON BUCKBOARD.—Glens Falls Gear.



No. 445. CARLSBAD CUBRICLE BUCKBOARD.—Glens Falls Gear.

WE AIM:

First - - AT DESIGN. Our designs are prepared with an eye to artistic proportion, combined with comfort.

Second - - AT QUALITY OF MATERIAL. We use nothing therein that is not of the Very Highest Grade.

Third - - AT WORKMANSHIP. We employ in their construction none but the highest class of workmen, experienced in Buckboard building.

Fourth - - AT FINISH. We finish these Vehicles in such a manner that they are not only beautiful when new, but they will grow old gracefully, taking on with age those rich tones and colorings so pleasing to the artistic eye.

Fifth - - AT EQUIPMENT. Judged by the most critical and exacting standards, our equipment for comfort and convenience is complete in every detail.

Sixth - - AT PRICE. Our price is as low as it is possible to offer an absolutely high grade Buckboard.

Correspondence Solicited.

WATERLOO WAGON CO., Limited,
WATERLOO, SENECA COUNTY, N. Y., U. S. A.

Please mention "The Hub" when you write.



"Business is not what it used to be."

Moral:

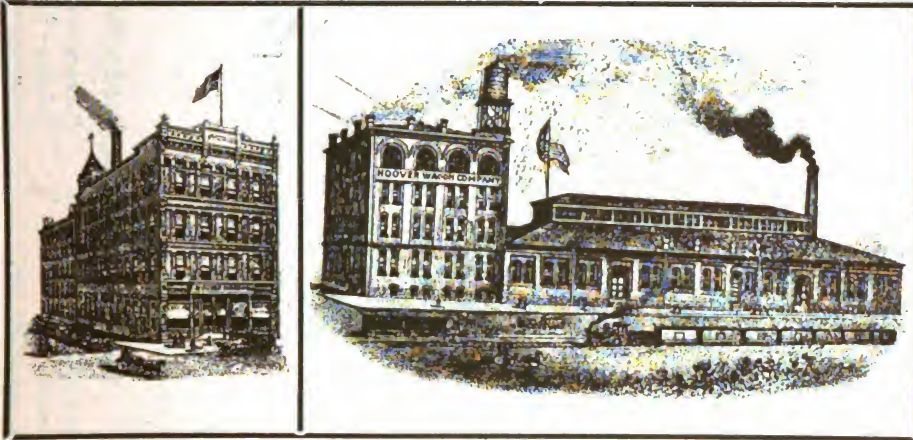
Sell The Up-to-date Line.

**Style,
Quality,
Price.**

Rex Buggy Company,
Are You With Us? **Connersville,**
Indiana.

Hoover Wagons

ONLY FIRST-CLASS MATERIAL USED IN THEIR CONSTRUCTION.



OFFICE, REPOSITORY AND FACTORY.

EXPRESS AND DELIVERY
WAGONS OF ALL KINDS.



EXPORT TRADE
SOLICITED. . .

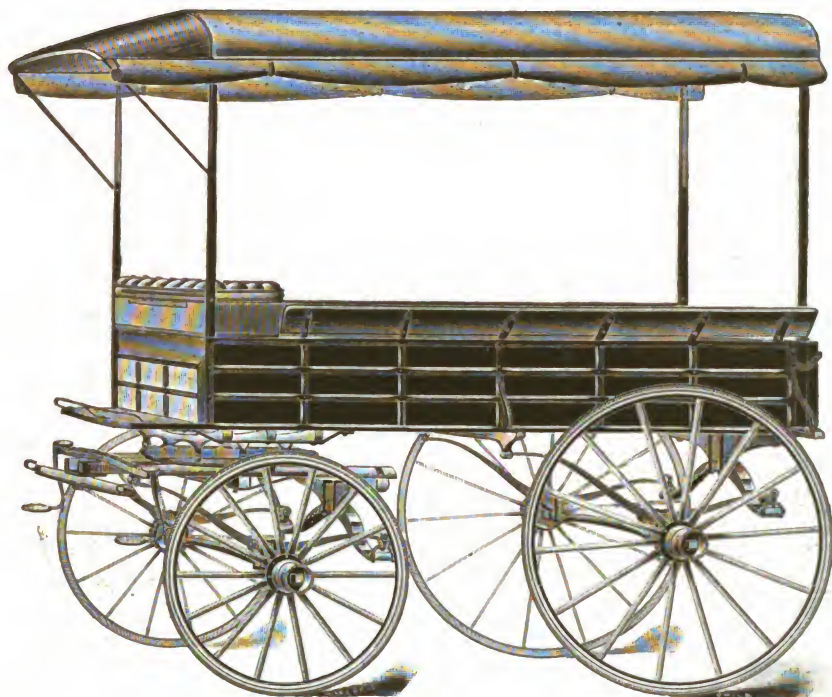


This Company has been Incorporated since January 1, 1900, and in that time has fortunately been able to secure the service of the best skilled employees in the various departments.

HONEST MADE
BUGGIES AND
OTHER PLEAS-
URE VEHICLES.



SPECIAL WAGONS
BUILT TO ORDER.



No. 7. "HOOVER" SHIFTING-TOP EXPRESS WAGON.

Body, ribbed, 8 ft. long, 3 ft. 10 in. wide, outside measure. Chain on end gate. *Top*, made with posts hinged to top rail, can be taken off and folded, requiring very little place for storage; the top and sides are covered with heavy waterproof sail duck, which is fastened to top with straps; can be removed, folded and laid away when not in use. *Gear* (Selfie Platform Truss), 1½ in. axles and wheels. *Springs*, side 38 in. by 6 plate, cross 42 in. by 7 plate, 1½ in. wide. *Painting*, body panels, green; ribs, black; top posts and frame, red; gear, vermilion; nicely striped and ornamented. *Capacity*, 2,000 pounds. *Weight*, 800 pounds.

HOOVER MOTTO:—"A DOLLAR'S WORTH FOR A DOLLAR,
SERVED AS YOU WANT IT."

These Wagons are manufactured for the trade only, by the

HOOVER WAGON CO.

Successor to G. W. HOOVER & SONS,

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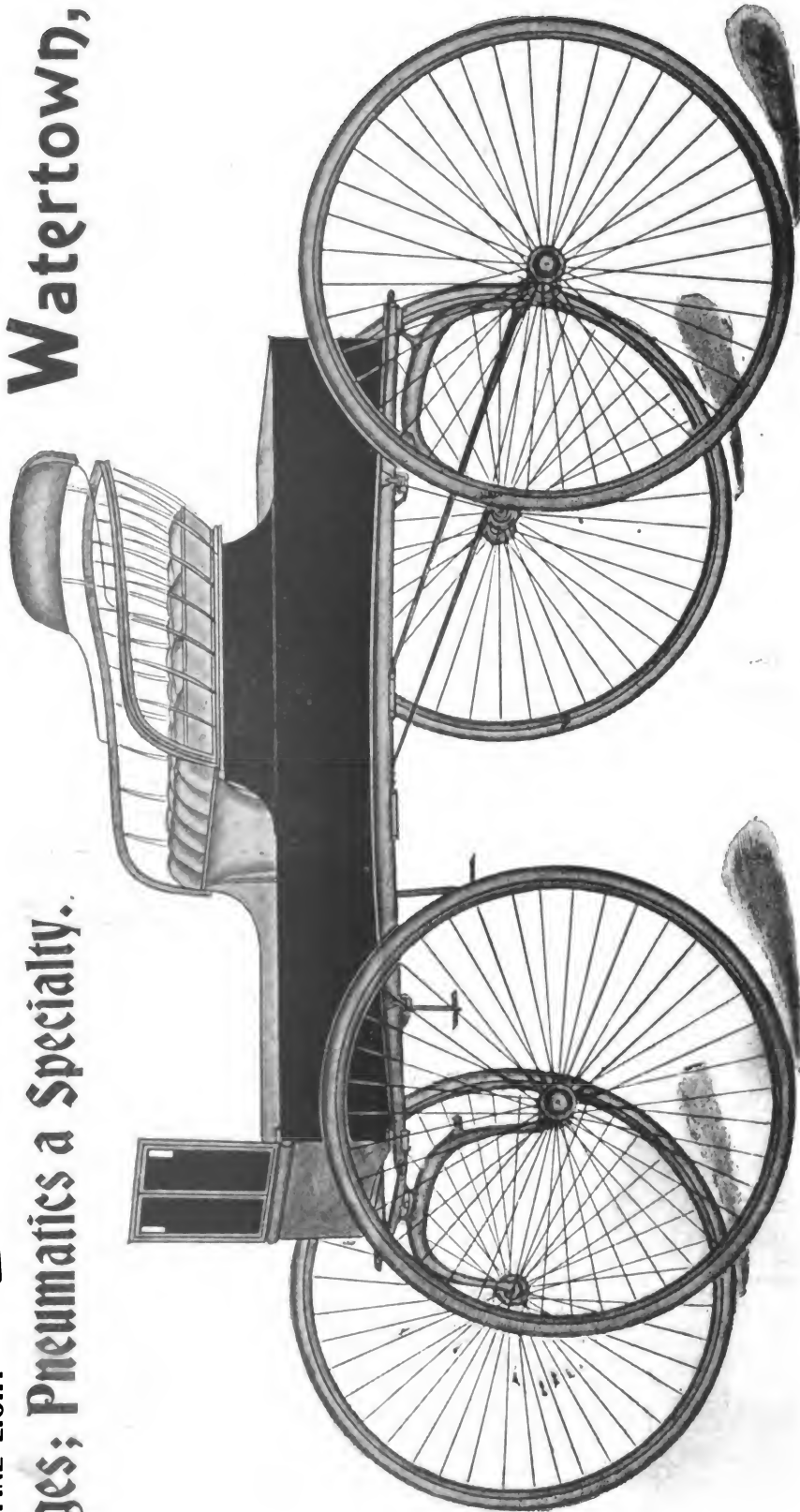
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BUILDERS OF FINE LIGHT

Carriages; Pneumatics a Specialty.

Watertown, N. Y.



XXXX. Close Hitch, (Patented.)

The lightest Pneumatic Wagon built for road use. Capable of carrying two persons.

No. 20. CLOSE HITCH ROADSTER.

Body—22 x 54, seat top of cushion 27 x 18.
Tubular Axles, ball bearing.
Wheels—34 and 36, 2 in. pneumatic tire.

Distance from floor to axle, 24½ in.
Painting—Body, black; Gear, carmine.
Trimming—Blue cloth or whipcord.

No. 15. CLOSE HITCH SPEEDER.

Body—17 x 52, seat top of cushion 21 x 18.
Tubular Axles, ball bearing.
Wheels—30 and 32, 1½ pneumatic tire.

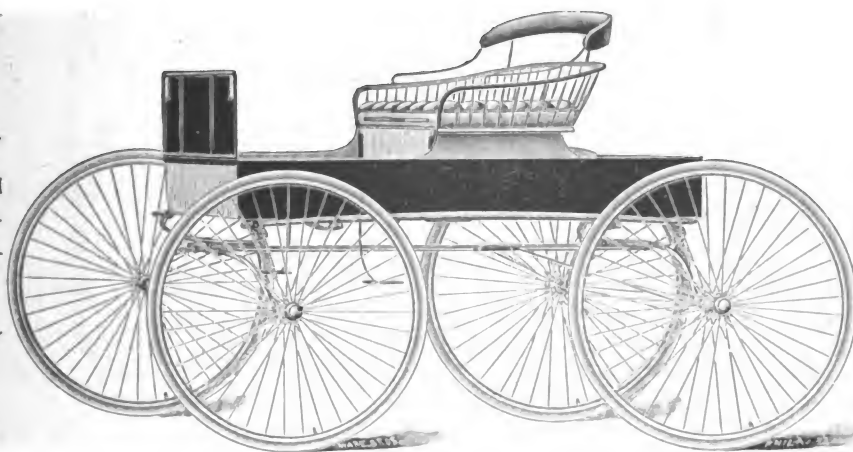
Distance from floor to axle 24¼ in.
Painting—Body, black; Gear, carmine.
Trimming—Blue cloth or whipcord.

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Genuine STIVERS RUNABOUTS

ARE ACKNOWLEDGED TO BE THE MOST SATISFACTORY BIKE WAGONS BUILT. DON'T WASTE MONEY EXPERIMENTING, BUT USE A STIVERS GEAR FOR BIKE WAGONS TO GET AND HOLD THE TRADE. * * * *

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and their Interests
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Infringements
Promptly
Prosecuted.

THE BEST EVIDENCE OF ITS POPULARITY IS THE MANY EFFORTS AT IMITATION.

PATENTS OWNED AND CONTROLLED BY THE

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THE WERNER SPEED WAGON.

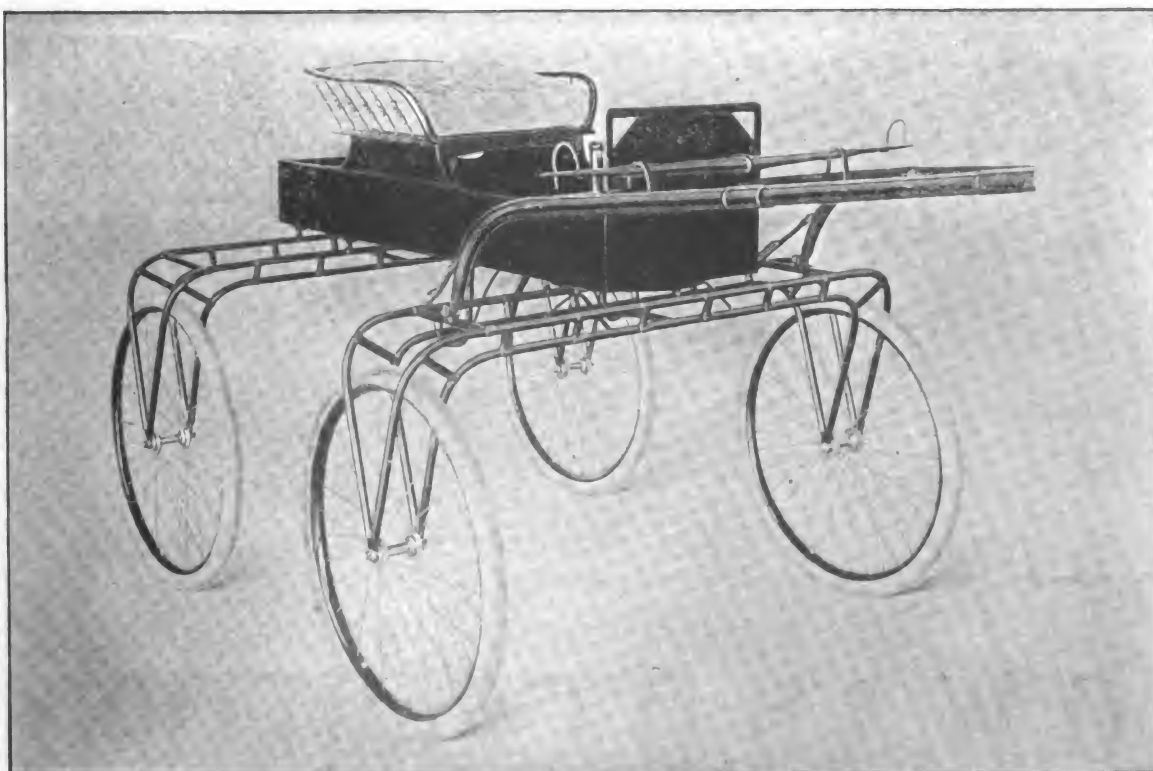
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TRACK AND
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LIGHTNESS,
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FINEST BEARINGS.
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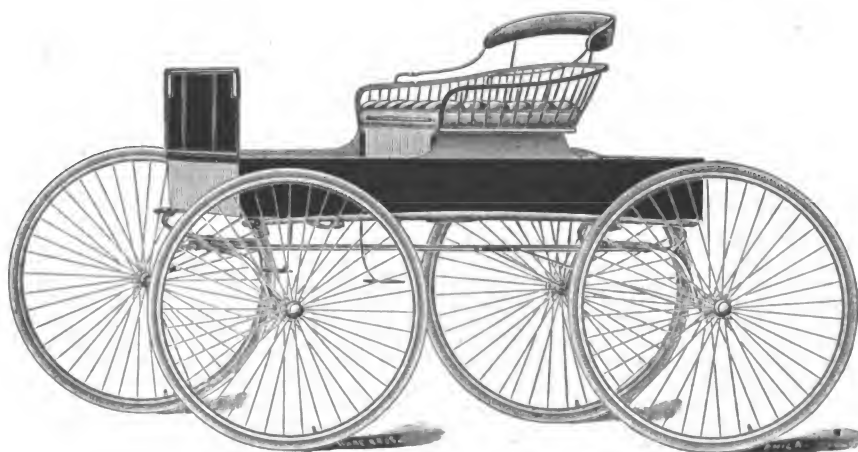
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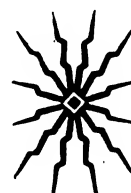
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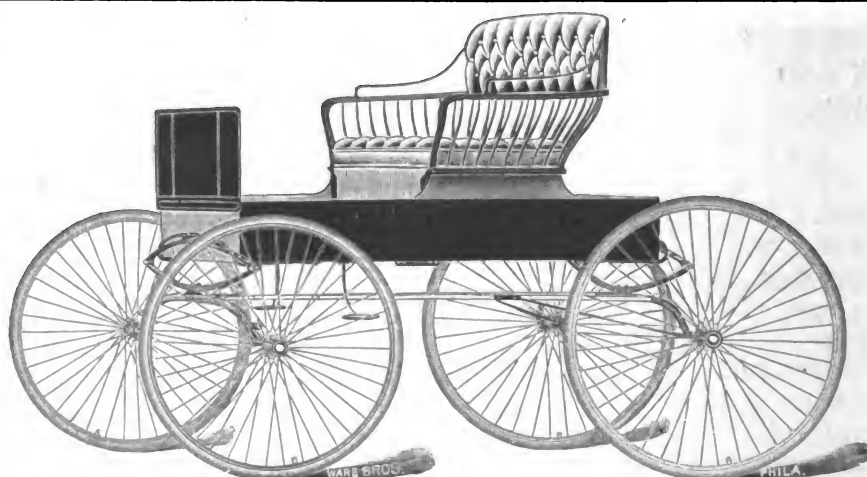


No. 50.

Gentlemen's Light Road Wagon or Speeder.



THE STIVERS GEAR A SPECIALTY.



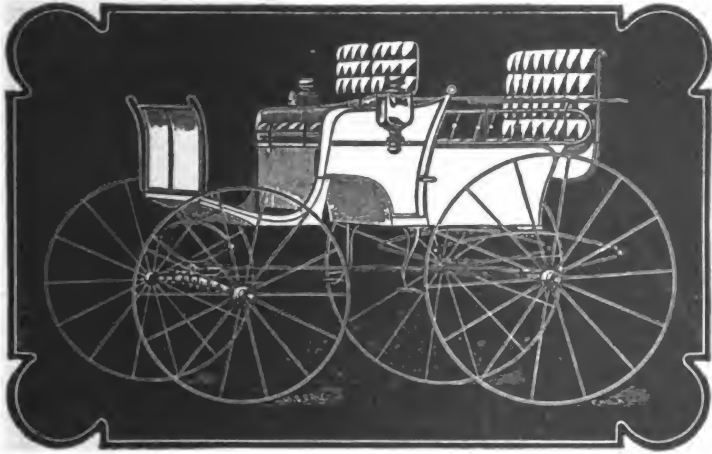
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End Spring Pneumatic Runabout.

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DELHI, N. Y.

**We Build the Finest Line of
Traps, Cut-unders and
Straight Sills on the Market.**



No. 27 PARK VIEW TRAP (Patented.)
Showing same as two seated.

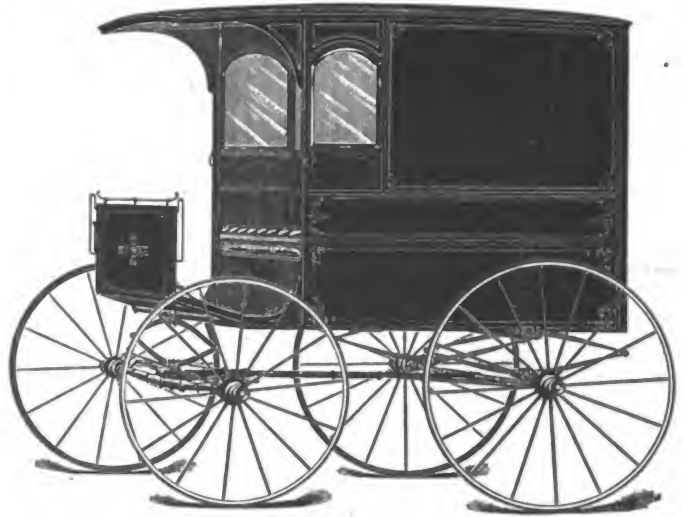
**Our side opening Traps are the
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Runabouts with Pneumatic and Common
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Want Something Good?

*Good things usually come high, but then some articles
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*Our wagons are good wagons to handle because of their
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*MR. DEALER: We are after you and that
for your good. Write and see if you don't
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ELIZABETHTOWN, PA.

Blees-McVicker Carriage Co.

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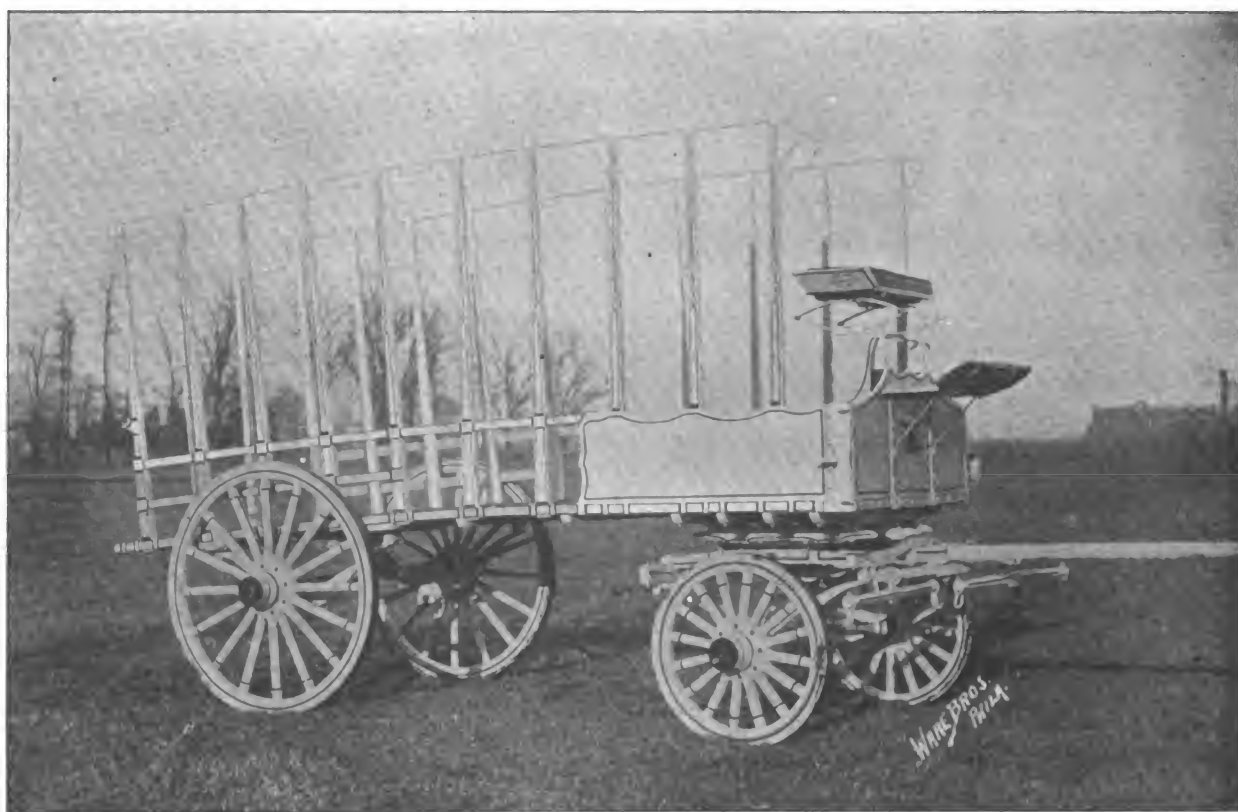
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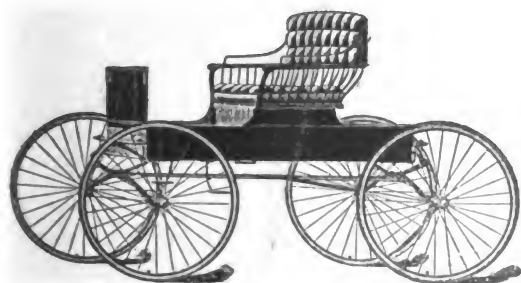
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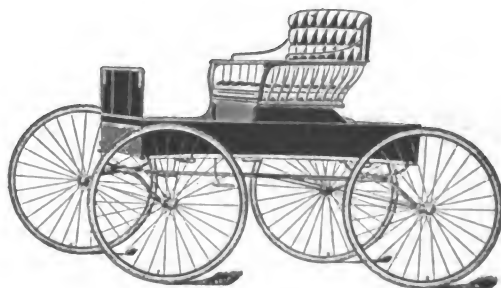


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Pony and Cob Vehicles.

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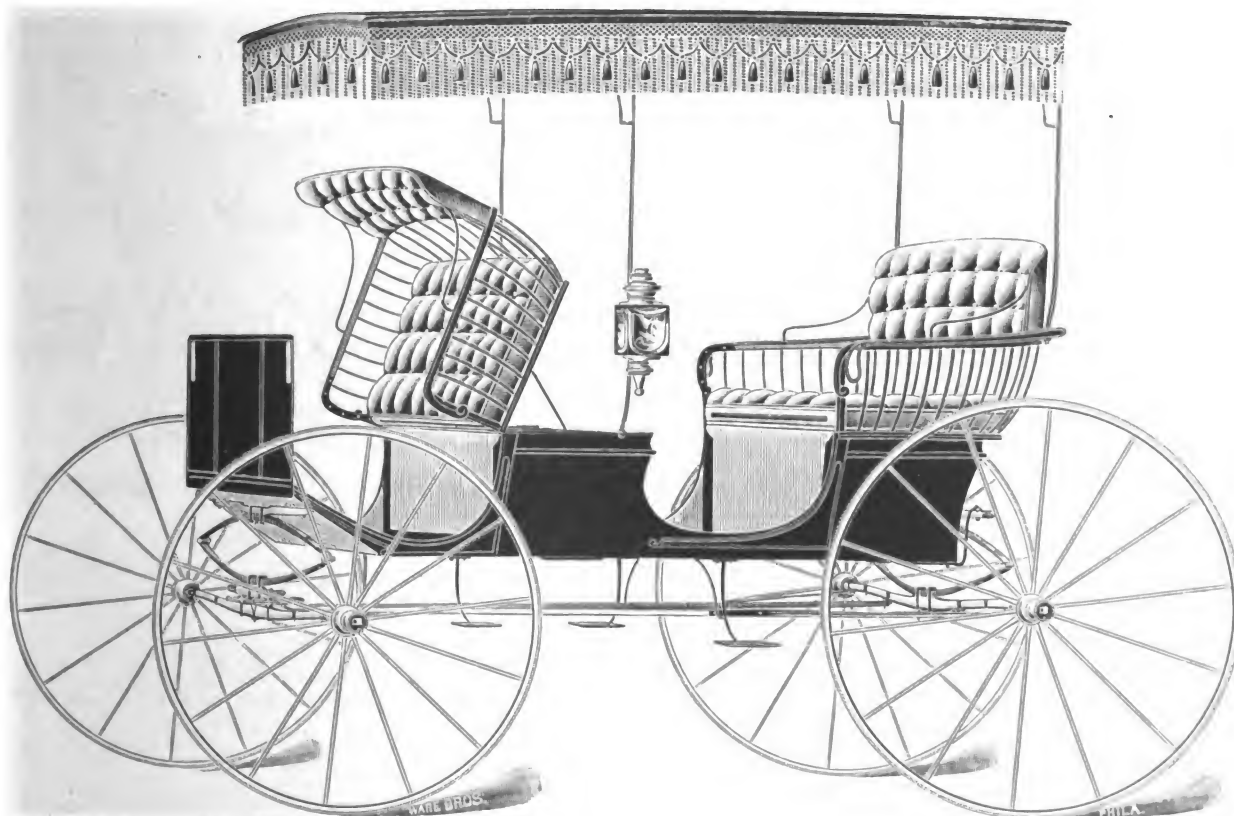
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Another of our Specialties—

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It is impossible to do this vehicle justice with an illustration, it being complete to the minutest detail, and is constructed with an eye single to the wants of the physician. We have equipped it with every convenience for his comfort and it is easy of ingress and exit. In all a very attractive and up-to-date carriage, and like all our specialties sells almost on sight.



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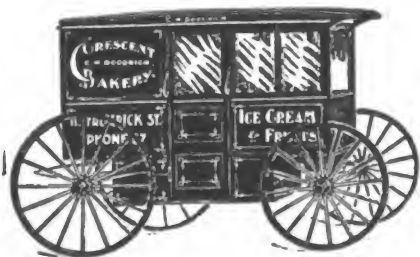
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Our low down ball bearing, short turn **MILK** and **BAKERY** Wagons are giving universal satisfaction.



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The famous WINKLER PATENT **SPRINKLING** WAGONS.

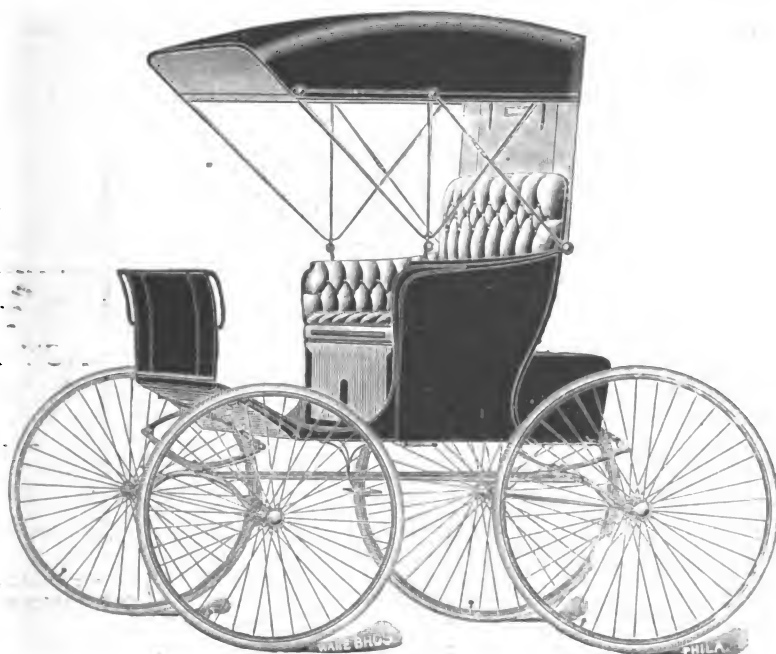
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LIGHT DRAFT.
EASY OF ACTION.**

Made in different sizes and styles of Gears.

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**PNEUMATIC WAGONS of Every Description,
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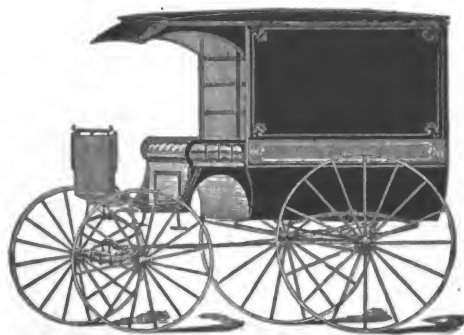
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Best in the Market

We build
Honest Wagons
at
Honest Prices.



No. 35

The
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of our work is
Guaranteed.

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Cincinnati, Ohio.

BUOB & SCHEU,



Please mention "The Hub" when you write.

Manufacturers of
**BUGGIES, SURREYS, PONY
VEHICLES and
BUGGY and CARRIAGE
TOPS,
BUGGY and WAGON CUSHIONS
AND ALL KINDS OF
Carriage Trimmings.**

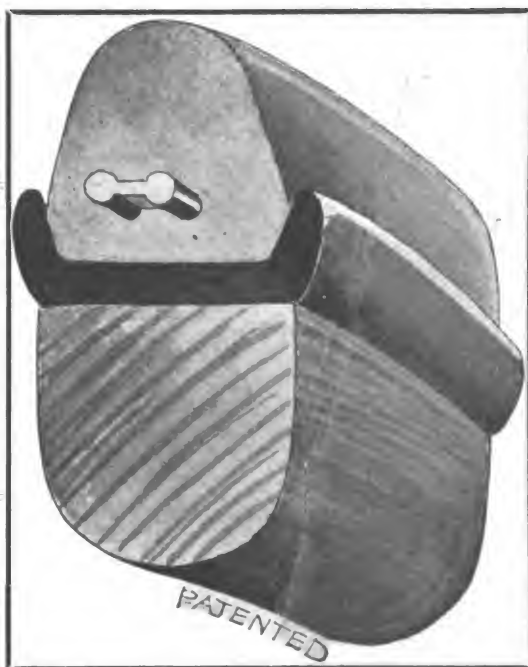
Write for Three Special Catalogues.
WE GUARANTEE OUR PRICES.



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That this Tire has
points of *✱ ✱ ✱*
SUPERIORITY
Distinctly its own.
It lasts all over. *✱*



That this Tire has
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Cannot
DISAPPOINT YOU.
IT WEARS.

THIS TREAD IS DESIGNED FOR DURABILITY

*This Band allows the Tread to do its
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by CUTTING THROUGH BASE.*

WE MAKE OUR OWN RUBBER.

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BUCHANAN DOUBLE WHEEL.

TO Manufacturers of Trucks, Farm Wagons, Delivery Wagons, Carriages, etc., I present to you a great improvement in vehicles. The firm who secures the best terms to manufacture will get a valuable privilege. Everybody who drives, rides, delivers goods, runs an automobile or does trucking, will see at once the advantage of my patent over all other vehicles.

TRUCKING and DRIVING.

WHEELS of carriages are made large to reduce the jolt. On trucks they are made large to reduce the power necessary to draw them along. My patent (two wheels on one end of axle) illustrated, will do the same better with wheels half as heavy, and half as high; the fact of the weight being between two wheels reduces the jolt going up or down one half, and the power necessary to draw it over any obstruction one half at a time. The rougher the road, the more good it will do.

STARTING.—When a load comes to a stand the heaviest wheel drops into the deepest hole. My patent divides the load so that the power necessary to start the load is greatly reduced.

HOLES.—Drivers need not fear a hole; the jolt will be reduced one half, hence there will not be any bones or springs broken.

Pulling through mud, sand or a field, the wheels will not sink in on account of the number of them, and all tires can be very narrow.

DRIVING.—Most of the country roads have ruts where the wheels of a vehicle go up and down, and the occupant goes up and down with them, and in a short time he gets tired, turns the vehicle around and goes home. No such thing with my rig. The ups and downs are reduced to such a minimum that the only thing which makes him turn is limited time.

Those readers who ride a bicycle will understand my patent when I tell them it is the same difference on every wheel of a wagon as it is to them, when going over a hole or a railroad crossing, for which they raise themselves up from their saddles and stand on their pedals; the jar is almost entirely gone.

DOWN HILL.—More wheels will make it easier for a horse or brake to hold it back.

UP HILL.—Hills as a general thing are the roughest part of a road, on account of every storm washing them out. The best results of patent will be found going up hill.

ON THE ROAD.—The advocates of good roads recommend wide tires. I recommend more wheels under a load. My patent is the only way to do it.

BREAKAGE.—For those who cart dynamite, glassware, crockery, breakable articles, or anything which can be damaged by constant racking, as the regular wagon does, will find in my vehicle a big saving.

INVALIDS.—Invalids and injured people who cannot stand the strain of being driven far, will find in this vehicle a great comfort, as they will not tire half so quick.

AMBULANCES.—Nothing could be better for ambulances.

TIME SAVER.—You need my patent on your wagon, because you can save time. You won't have to slow up at every rough place, nor at every hole or turn in the road. At the same time you won't be shaken to pieces. It will be as smooth as a good many trolley cars, without the jerk they give when starting or stopping.

POWER SAVER.—Every place a driver has to slack up on account of a rough place on a road is a loss of power, be it horses or automobile. The ability to drive over anything without a heavy jolt is a big gain.

THROWING MUD.—My wheels being small, will not throw mud into carriages.

TIPPING.—Low wheels will prevent a vehicle from turning over.

PRINCIPLE.—The principle of my patent is like this: In the case of a contractor, he has a lot of sand to deliver a mile or two away. Ordinarily it will take ten trips of the four wheel trucks he owns. He gets an eight wheel truck of a dealer who makes them on a license from me, and does it in eight trips. Why is this? Because every obstruction the wheels go over is easier by fifty per cent., as the load is lifted only half as high. Every hole the load only goes down half as deep, and consequently it is only necessary to raise it half as much to get it out again.

ILLUSTRATION.—The patent is on its ability to turn by the use of any kind of a hinge.

DURABILITY.—If iron tires are used, there will be a saving in the resetting, either because they will be lighter or smaller. Rubber tires, on account of the smaller wheel, will be much cheaper.

BUILDING.—Vehicles can be built lower down, making it easier to get in or out, and for loading and unloading. Springs can be lighter. The body, in case the wheels are small, can be built over them. There wouldn't be any necessity to back up to a curb if this plan were adopted, and mud or dirt could not be thrown into wagons or against the sides. Less cleaning would be necessary.

FOR THE TRADE.—I propose to give the manufacturers of vehicles the privilege, by special arrangements, to build these wagons. Anyone who sells one without my sanction will be sued for damages. The manufacturer who makes the application first will be given the best privileges.

Arrangements for the application of the patent made only through dealers.

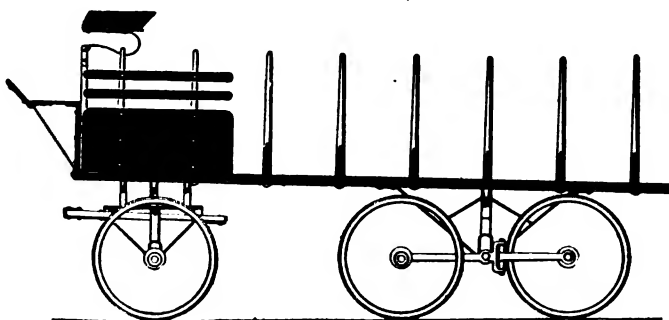
The patent can be used on automobiles, or any vehicle drawn along a road on wheels.

The patent on any vehicle will make a good advertisement.

Jobbers who get this journal and think well of the patent, send it to your factory, and tell them so.

A hay or lumber wagon will be a cheap way of demonstrating my claims.

Can be used on either two-wheel or four-wheel vehicles.



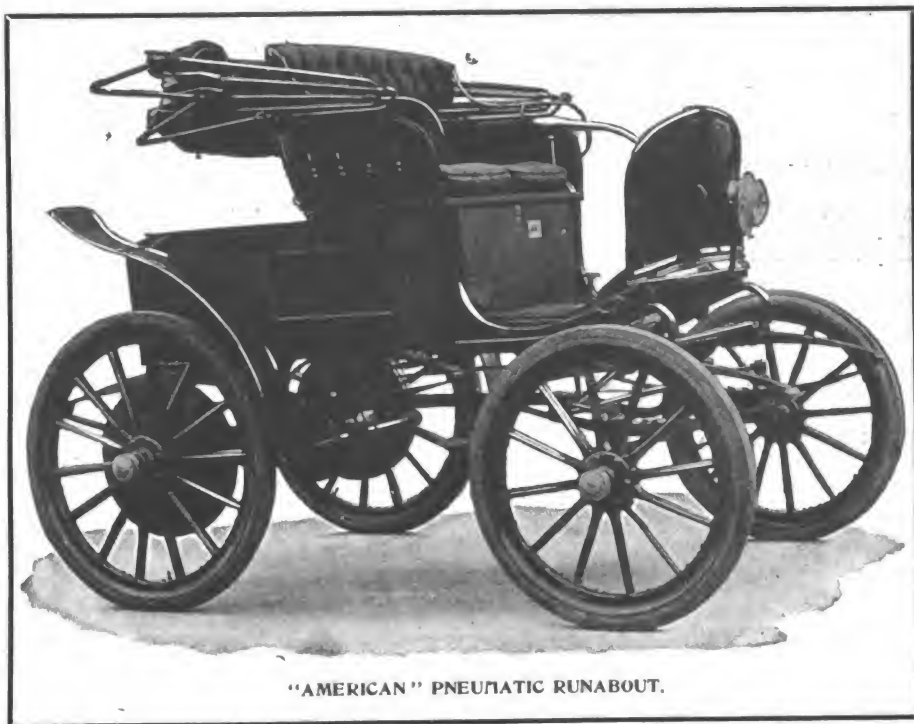
This Truck is fitted with the Buchanan Double Wheel.

JAMES BUCHANAN,

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Get a Good Night's Rest.

The carriage man who buys a part of his work in the white don't have so much to worry him.

He don't have so many factory details to look after.

Or so much fire insurance to carry.

Or so much estimating to do.

Not he. The man who buys our work in the white has more time to get out and drum up orders.

Or to look after his other styles.

Or to go fishing or to ball games.

He enjoys life. His days are free from worry, and his nights are free from the nightmare of business.

And he makes more money than his neighbor, who worries and stews and hustles all day long.

And then goes home at night and hustles and stews and worries it all over again before he gets asleep.

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Hydro-Carbon Motor.
Electric Current required for Ignition provided
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Ignition Regular and reliable.

Speed at Will of Operator and
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WIRE SPOKES.

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WE MAKE ALL SIZES OF MOTOR VEHICLE AND
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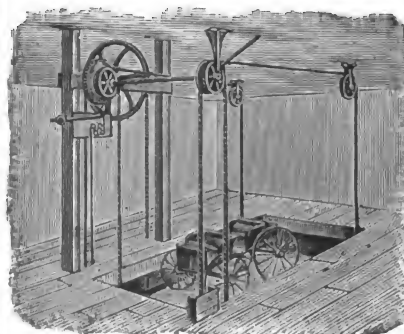
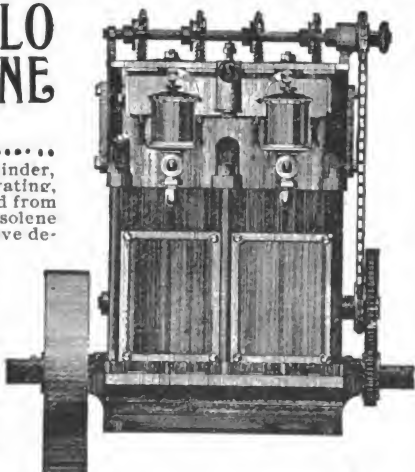
manufacturer and dealer in 20 Foreign Countries. Give it a trial and be convinced. For rates and further particulars, write
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Does it interest you? Are you looking for it? If so, we think
you would find it to your advantage if you were represented in
THE HUB, as it reaches almost every responsible carriage

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This cut shows our four cylinder,
4½ horse power, non-vibrating,
shifting spark, varying speed from
100 to 1,500 revolutions, Gasoline
Vehicle Motor, which we have de-
monstrated to be the most
practical power in the mar-
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18 x 20 inches, manu-
factured upright or horizon-
tal; weight 175 pounds. We
build from one to eight
horse power. For vehicles,
boats and light stationary
work, we can prove superi-
ority. *Send for Circular.*

BUFFALO GASOLENE MOTOR CO.,
Dewitt and Bradley Streets,
BUFFALO, N. Y.

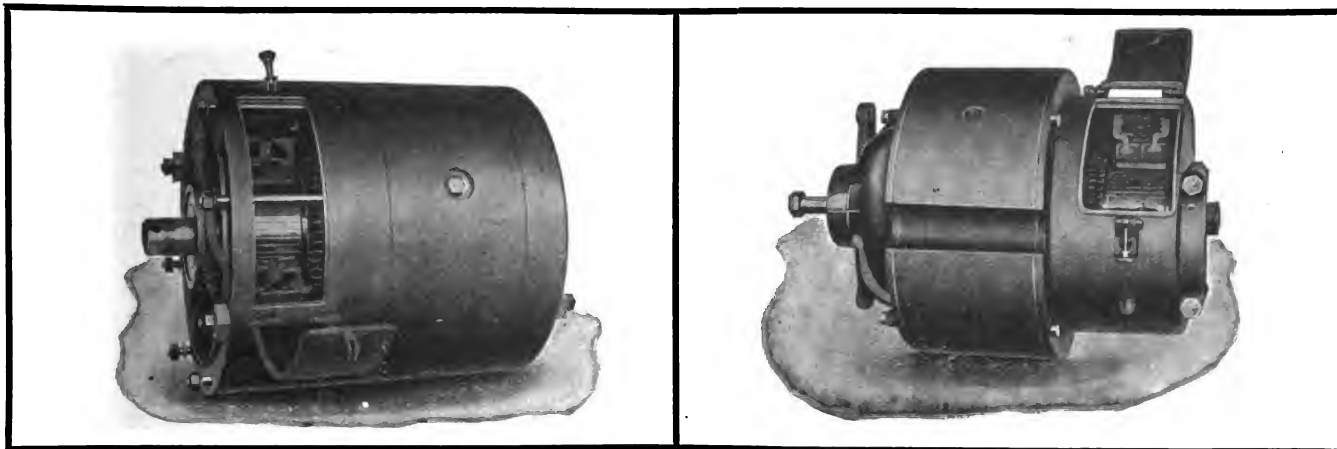


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Passenger and Freight
of every description.
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Motors designed to suit the individual requirements of manufacturers. Our Automobile Motors are running to-day on hundreds of motor vehicles and are giving universal satisfaction.

THE EDDY ELECTRIC MFG. CO., WINDSOR, CONN.

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SCREW TOP AND SPOUT. * * * * *



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Automobiles,
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and Bicycles.

**The American Specialty
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Send for Catalogue.



The "*Locomobile*" Company of America is now ready to turn out in large quantities a new and improved "*Locomobile*" which is the result of one year's experience.

1,000 "*Locomobiles*" are in actual use, all giving excellent satisfaction.

The following are some of the most important changes and alterations which have been made in the new model:—

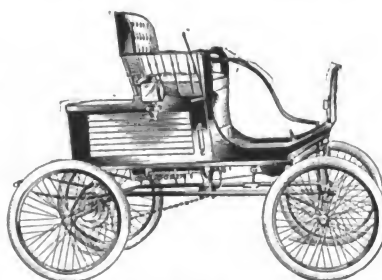
50 per cent. increase in the water supply; larger and heavier fuel tank; larger and heavier air tank; wider tread; wider seat; wider body; side steering lever; auxiliary throttle valve and locking device; self-feeding oil cup for the cylinders; safety valve blows off in the water tank without noise.

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Paris.
E. J. Halséy, 52 Sussex Pl.,
So. Kensington, London.

Address all inquiries to

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GASOLINE MOTORS.

FLANGE COOLED
For Bicycles and Tricycles.

WATER JACKETED
For Vehicles and Launches.

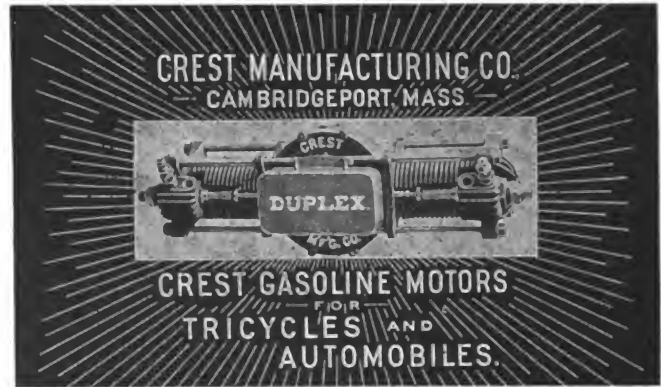
Single and Double Cylinder Motors, one to seven horse power.

BICYCLE MOTOR. Also Castings in Sets with Working Drawings.

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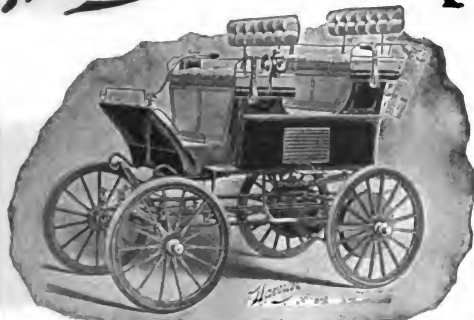
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THE LIGHTEST AND CHEAPEST MOTOR PER HORSE POWER MADE IN THE WORLD.

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OUR LINE COMPRISES 18 MODELS, FROM A TWO PASSENGER RUNABOUT TO A NINE-PASSENGER BREAK, ALL GUARANTEED MECHANICALLY AND ELECTRICALLY. WE REMOVE ALL DOUBTS AS TO EFFICIENT DURABILITY BY SUPPLYING A CONTRACT TO MAINTAIN BATTERY FOR FIVE YEARS.

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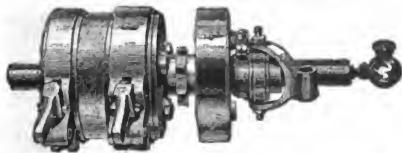
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What gear are you using or do you propose to use in your automobile?

The selection of a gear is as important as the carriage itself. A good gear is indispensable. The best will save you much worry and expense and give your vehicle the proper speed. There are many gears, but there is only

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ABSOLUTELY DUST PROOF.

It has two speeds and reverse. No Shocks. Change of speed by brakes. Speed ratio may be arranged at will.

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2 Sizes. No. 1. 4 to 5 H. P., 35 pounds.

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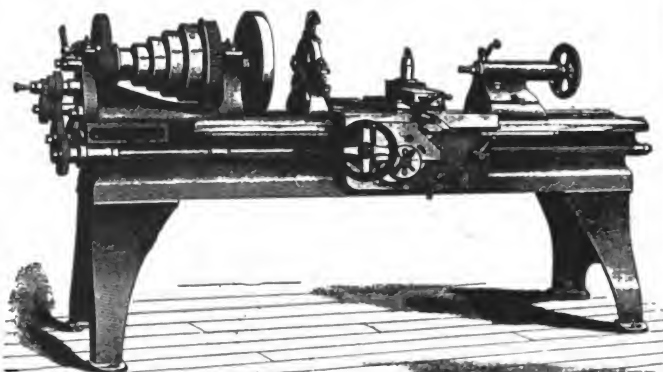
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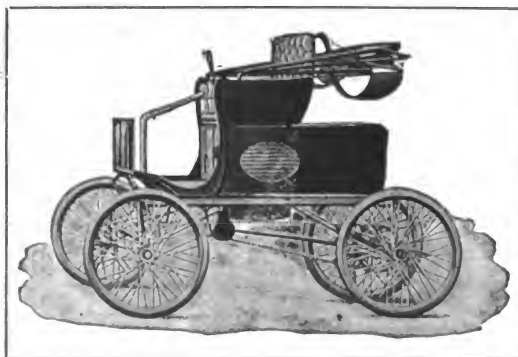
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Of the Heat of the Exhaust is Saved and Used by Our Methods while other makers discharge it.

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MORE MILEAGE WITH EQUAL AMOUNT OF WATER THAN ANY OTHER STEAM CARRIAGE.

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LESS FUEL USED, OWING TO OUR PERFECT PATENTED INDESTRUCTIBLE BURNER.

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HEAVIER GRADES CAN BE TRAVELED AND STILL HOLD THE PRESSURE, THAN ANY OTHER HORSELESS VEHICLE.

BALDWIN AUTOMOBILE MFG. CO.
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FACTORY OF THE MOBILE COMPANY OF AMERICA.—VIEW LOOKING SOUTH.

THE "MOBILE" A CARRIAGE FOR EVERY-DAY USE.

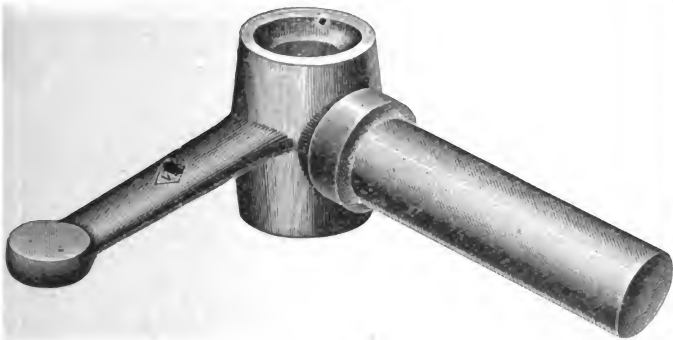
ON June 10th, four "Mobiles" started in the middle of the afternoon from the factory of The Mobile Company of America at Kingsland-Point-on-the-Hudson and ran to West Point, reaching the ferry at Garrisons in time for the 5:15 boat. Two hours and a half were spent in running about the Military Academy roads, then, after dinner, the four carriages started home by moonlight. The road from Kingsland Point to West Point is hilly, with many steep gradients scattered over its length; but from the State Camp at Peekskill through the Highlands of the Hudson to West Point occur long climbs and very steep and rough roads. The distance traveled was approximately, including the running at the Academy grounds, sixty-five miles. Not a delay or accident of any kind occurred; not a moment's worry to anyone of the eight people who made the journey. The "Mobiles" were in as good condition at the end as at the start—not one, but the entire four—and one of them had come up from New York to Kingsland Point before starting for West Point.

This gives an idea of what the "Mobile" is—a splendid piece of machinery, satisfactory in all its parts, of the best quality and workmanship throughout. Price, \$750. All visitors can inspect every department of the manufacture of "Mobiles." Twenty-five trains stop at Philipse Manor, the station on the company's grounds.

For information regarding "Mobiles" address

THE "MOBILE" COMPANY OF AMERICA,

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BLUE PRINTS OF THIS AND COMPANION STOCK STEERING GEAR PART AT YOUR COMMAND.

Just The Thing

in special or stock drop-forgings is an unusual find. Sober thought and communication with us may quickly develop it, however. First, see stock line described in 1900 Catalogue "E" and if not satisfied, set your task before us. We will try to please you.

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ONE GRADE—HIGHEST.

THEY ARE MADE WELL.

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THEY BURN WELL.

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THE ONLY COMPLETE LINE IN THE WORLD. WRITE US.

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THE STYLISH-OHIO Electric Carriage Light

OPERATED BY SERIES-MULTIPLE DRY BATTERY

Solves the Problem of Portable Lighting, and gives to us a Driving Lamp that is at once



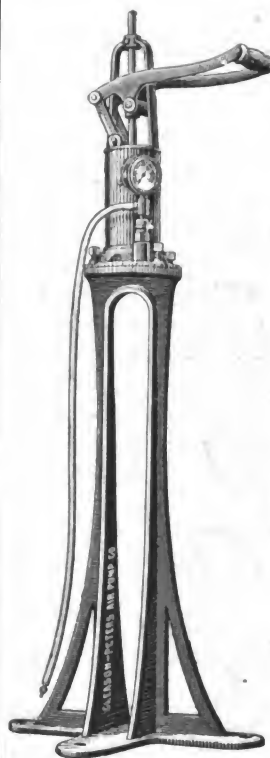
**Efficient,
Elegant and
Economical.**

Eight or ten of our improved dry cells are arranged in a neat case, in series-multiple, so as to obtain long life, and no charging or other attention is required. The outfit is furnished ready for use and can be attached to any carriage in one minute. The light can be turned on and off at will. The Reflector, a true parabola, magnifies eight times the three-candle lamp, causing it to throw its rays two hundred feet. The Lamp is six times the efficiency of ordinary incandescent lamps, taking only one-half watt to the candle-power. At an e. m. f. of 7 volts only .20 of an ampere is used, a fine light produced, and imperceptible use of the battery readily recuperated by a day's rest.

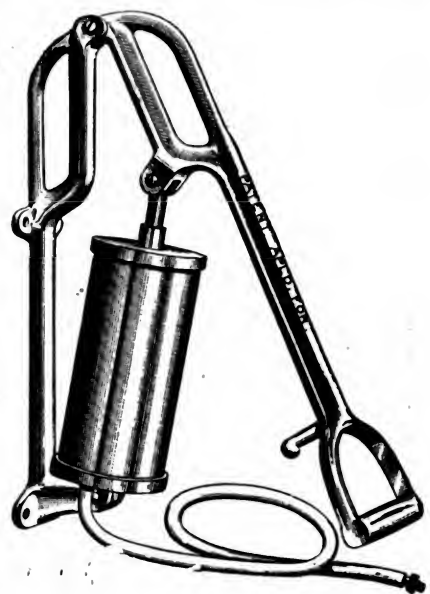
\$3.95 This outfit consists of Lamp, Reflector, Combination Bracket for attaching to carriage, Conductor Cord, Connectors and 8-cell Dry Battery in neat case, ready for use. Our lowest price for this outfit is \$3.95; two for \$7. *Catalogue free.*

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No. 121.



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MOTOR VEHICLES.

New Process Raw Hide Pinions are used by all the leading manufacturers. Spur, Bevel and Friction. We also furnish Metal Gears.



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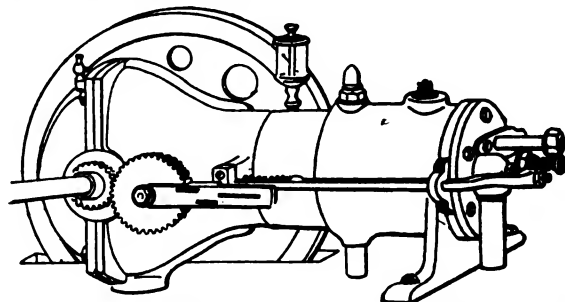
The New Process Raw Hide Co.

Patentees and Sole Manufacturers,
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THE ONLY RELIABLE MOTORS FOR HORSELESS VEHICLES.

OURS can be run at cost of less than 1-cent per hour (a horse power—larger ones same ratio). **SPECIAL MOTORS** and **TRANSMISSION GEARS** for Carriages and others to construct **THEIR OWN VEHICLES.**



WE believe this to be the very best Gasoline Motor ever placed on the market for simplicity, durability, more power and less weight than anything ever produced. Especially adapted for Motor Wagons.

Boats, Small Electrical Plants, Elevators, Machine Shops, Optical Works, Printing Presses, Feed Cutters, Carpenter Shops, Lathes, Emery Wheels, Corn Shellers, Laundry Machines, Pumping Water, Ice Cream Freezers, Irrigation Machinery, Ventilating Fans, Hay Presses, Cream Separator, Sewing Machines, Mining Machinery, Sawing Wood, etc., etc.

These Motors are manufactured horizontal or upright. They are absolutely safe, and cannot explode or cause damage, and are always ready for instant service. They require no mechanical experience or licensed engineer.

Our 2-horse-power Motor weighs but 80 pounds, and occupies a space 24x11 inches; runs at high speed and high compression. Working parts are all tightly enclosed; one sight feed oil cup lubricates all bearings. Our ignition device is perfect, and all wearing parts are especially strong and substantial.

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UNDERTAKES:—The manufacture of Automobiles and Motor-Cycles.
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TAXES REMARKABLY
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SHIPPING FACILITIES
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Automobiles.

Particularly adaptable to the building of Automobiles. In a community of expert mechanics. One hundred and ten horse power steam engine. Plant in first-class repair. Plant lighted by own power, 400 lamps. Property covers four acres of land.

OVER 100,000 SQUARE FEET.

Has Grinding and Japanning building with three large Japan ovens, Nickel-plating Department, Engine and Boiler House, Pattern Shop, Storehouse for Patterns, Annealing Room, Blacksmithing Shop, Tumbling Room, Fan Room, Foundry, Core and Flask Room, Wood Pattern Shop. Foundry equipped with 6 ton modern Cupola, Machine Shops and Office Buildings. The very best sprinkling and fire extinguishing apparatus. Fire engine house 1,000 feet from factory. Railway Station, 2 minutes. Substantially constructed and in good condition and repair.

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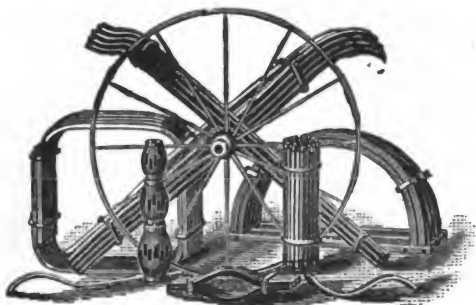
The original Philipse Manor, two hundred and twenty years old, still stands on the company's property, and the railroad company has appropriately, in view of its historical and literary associations, given this name to the station. The run from the Grand Central Station in New York is one hour. The manor house and old mill and Sleepy Hollow are part of the company's property, connected by the Headless Horseman's Bridge. The old Dutch Church, and Washington Irving's grave and the monument marking the spot where André was captured, are in the immediate vicinity. When you visit New York, you will find a trip to the factory of

THE "MOBILE" COMPANY OF AMERICA

quite worth a half day's outing. Kingsland Point itself is considered to be the most beautiful section of the Hudson. The visitor is looked after by The "Mobile" Company's corps of demonstrators, taken for a ride in a horseless carriage, and shown all the different processes which enter into the fifteen departments required to manufacture a horseless carriage. He may inspect both quality of material and workmanship, see the new carriages tested as they are taken from the works one after another, and have every opportunity to satisfy himself of the excellence of the carriage in every particular. Price, \$750 Complete.

THE "MOBILE" COMPANY OF AMERICA, Philipse Manor Station, Tarrytown, N. Y.

The Wheel and Wood Bending Company,



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Wheel Material and Bent Wood,

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WHEELS

MANUFACTURERS OF

The Modern Sign Writer

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IS WORTH DOUBLE THE PRICE.

45 Plates of Alphabets, Sign Lay-Outs and
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The name of the Chicago, Milwaukee & St. Paul Railway has long been identified with practical measures for the general upbuilding of its territory and the promotion of its commerce, hence manufacturers have an assurance that they will find themselves at home on the Company's lines.

The Company has all its territory districted in relation to resources, adaptability and advantages for manufacturing, and seeks to secure manufacturing plants and industries where the command of raw material, markets and surroundings will ensure their permanent success.

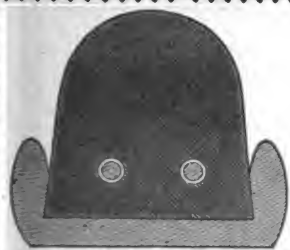
Mines of coal, iron, copper, lead and zinc, forests of soft and hard wood, quarries, clays of all kinds, tanbark, flax and other raw materials exist in its territory, in addition to the vast agricultural resources.

The Chicago, Milwaukee & St. Paul Railway Company owns 6,150 miles of railway, exclusive of second track, connecting track or sidings. The eight States traversed by the Company, Illinois, Wisconsin, Northern Michigan, Iowa, Missouri, Minnesota, South Dakota and North Dakota, possess, in addition to the advantages of raw material and proximity to markets, that which is the prime factor in the industrial success of a territory—a people who form one live and thriving community of business men, in whose midst it is safe and profitable to settle.

A number of new factories and industries have been induced to locate—largely through the instrumentality of this Company—at points along its lines. The central position of the States traversed by the Chicago, Milwaukee & St. Paul Railway makes it possible to command all the markets of the United States. The trend of manufacturing is westward. Confidential inquiries are treated as such. The information furnished a particular industry is reliable. Address

**LUIS JACKSON,
Industrial Commissioner C., M. & St. P. Ry.
660 Old Colony Building, CHICAGO, ILL.**

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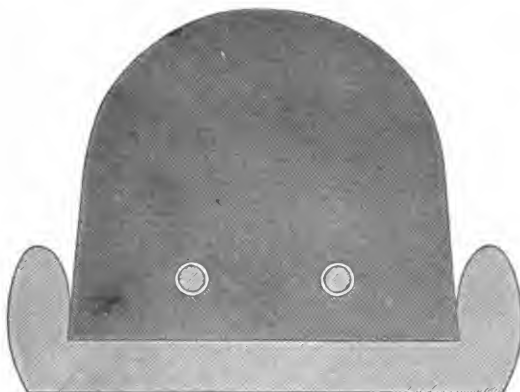
Patents applied for.

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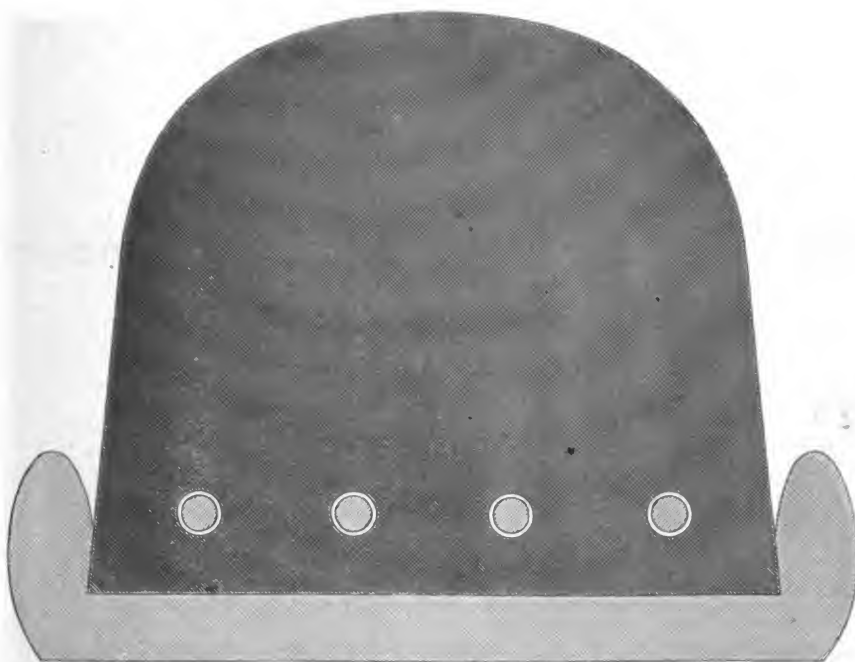
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Quick Shifter and
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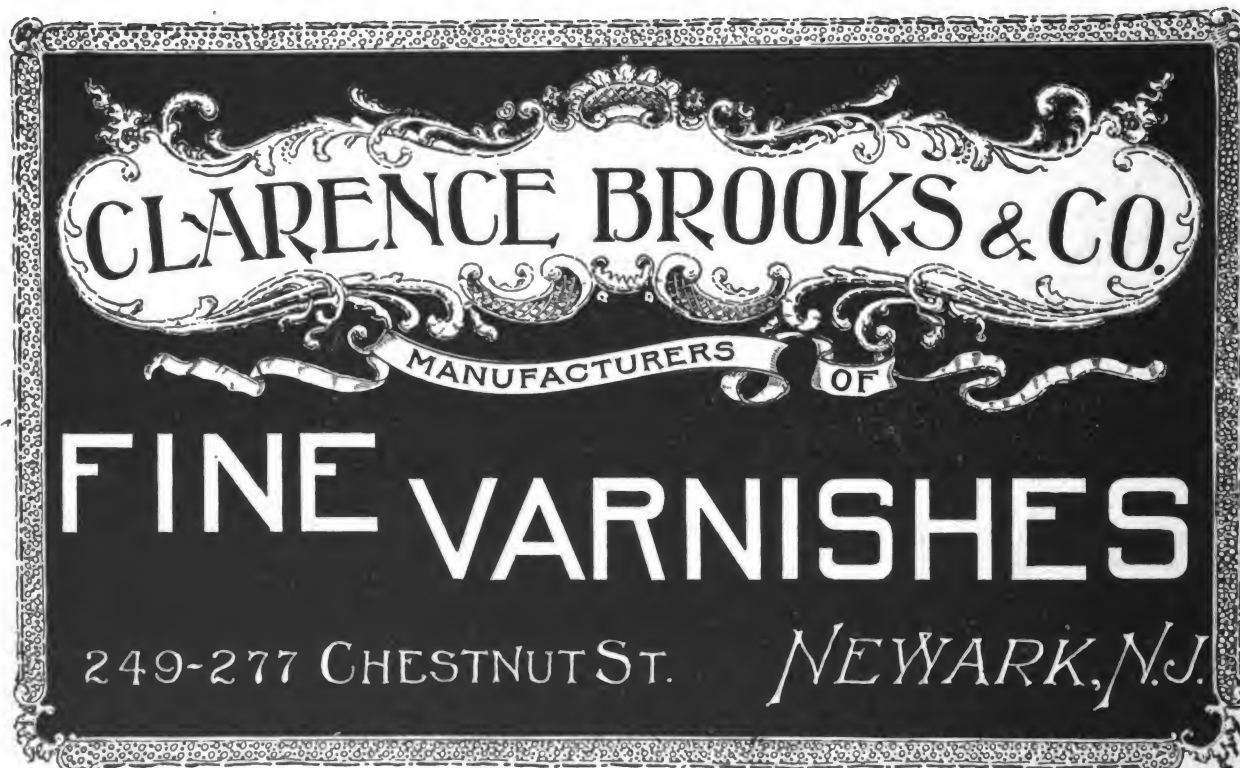
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The Higgin Manufacturing Co.

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MANUFACTURERS OF

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NEW YORK, JULY, 1900.

No. 4.

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TRADE NEWS PUBLISHING CO. OF N. Y.

W. H. TAYLOR, President.

WALTER D. GREGORY, Treasurer.

24-26 MURRAY STREET, . NEW YORK.

THE HUB is devoted to the interests of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also to the interests of Dealers.

Subscription Price for U. S. and Canada, \$2.00, *payable strictly in advance*. Single copies, 25 cents. Remittances at the risk of the subscriber, unless by registered letter, or by draft, express, check, or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for publication must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 15th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES.

ENGLAND.—R. Applegarth, 11 Queen Victoria st., London, England. Subscription price, 12s. 6d., or \$3.00.

FRANCE.—L. Dupont, publisher of *Le Guide du Carrossier*, 135 Boulevard Haussmann, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bonn a. Rh.; H. & T. Hampe & Co., 64 Alteswall, Hamburg. Subscription price, 12 marks, postpaid.

AUSTRALIA.—Henry Box & Son, 442 Little Collins st., Melbourne, Victoria. Subscription price, \$3.00 in advance.

The C. B. N. A. Convention.

It seems but a few weeks since we chronicled the great success of the C. B. N. A. convention at Indianapolis, and yet we are nearing the time for the next annual meeting, and to be ready it is necessary that all be up and doing. The Carriage Builders' National Association is a power for good, and it is the duty of its friends to see that nothing is done to lessen that power. It will not do to stand still, neither will it do to follow the will-of-the-wisp in a hunt for a change. The success of the association proves its foundation stable, and whatever changes are made should not threaten that stability. It has been proposed that dealers be invited to membership, and that the by-laws be changed so as to make it advantageous for them to do so. We do not believe an arrangement could be made that would be mutually satisfactory. Dealers are now eligible, but the written and unwritten laws of the association bar the introduction of questions affecting prices, etc. To the dealers these questions are vital and they can be acted upon only by organizations of

dealers, and it is right that they should be, but their introduction in an association where manufacturers constitute a strong element would inevitably lead to discord and disruption. There are hot heads on both sides, and they could not be controlled. Then, too, there are the manufacturers of materials, for whom strong efforts have been put forth to put them on the active list of members, with all the powers and privileges of the carriage builder. From the foundation of the organization the material manufacturers have been a power for good, having all rights, and receiving all recognition accorded to the active members, except to vote and hold office, and the association owes much of its prosperity to them. To make them active members, with voting and office holding powers, is to destroy their influence for good, and to invite discussions and the enactment of rules that will sap the life of the organization. These, like dealers, would gain nothing by active membership if they could not introduce the matter of prices, and this introduction could have but one effect. A few arbitrary men would be able to override all the restrictive rules of the association and make its conventions central points of discord. There are organizations among material manufacturers that fulfill all special requirements, and by the establishment of uniform rates protect the carriage builder as well as themselves, but whose associated interests differ from those of the active members of the C. B. N. A. How would it be possible to hold an organization together when a part of the membership are opposed to the business concerns of another part, whose interests are antagonistic so far as prices and conditions are concerned? It could not be done. As one prominent material manufacturer said, in substance, the day they make manufacturers of carriage materials active members of the C. B. N. A. will be the day that the organization will receive its death blow. No; let the C. B. N. A. remain a great social organization, in which there can be no disturbing elements of prices or wages, and whose work will be for the benefit of every man connected with the carriage industry, whether a member of the association or not, whether dealer, a producer or seller of accessories, or a carriage manufacturer. Let good will and the effort for good to all continue. Make the conventions a gathering of the clans, where all business or personal rivalries are buried under the greetings of good fellowship.



Manufacturers and Dealers

WITH the taking account of sales in midsummer comes the usual complaint from manufacturers of small profits, the charging off of losses, and the expressed determination to do away with "middlemen" and to sell to the consumer direct; but this resolution, like the many before it,

will be forgotten, or pigeon-holed for the time, and the middlemen will have their usual opportunity to lay in stock at safe prices. The time was when carriage builders depended largely upon local sales, at the factory or through branch houses. The latter was the favorite method with houses doing a southern trade before the sixties, while the manufacturer who sought sales far from home made up a string of vehicles and peddled them through the country; but time has changed all this, and the dealer or middleman has become a necessity. It is true that at times he assumes to be all there is to the business, and makes his threats against the manufacturer, just as the latter does against him; but he, too, meets the day when his independence is bottled up, and he recognizes the manufacturer as an important factor in his business. The truth is, each are mutually dependent, and the foolish antagonism has no power to develop. It is arrant folly to attempt to restrict the trade of either. We have yet to be shown a case where a blacklisted manufacturer has been affected in his business for any length of time; in fact, the statement made by one of the most prominent members of a dealers' organization, that "the men who have been listed are selling more than they did before, and directly to members of the organization that listed them," is very near the truth. Neither have we learned that any action taken by manufacturers has interfered with the dealer buying what he wanted, and buying on the most favorable terms. The question resolves itself into a financial one; on the one hand is what prices to ask, and on the other, what prices and terms can be obtained. There are men among the manufacturers and among the dealers who would gladly foment trouble, but they are few, and are great only in their self-conceit. The large body of manufacturers and dealers recognize the mutual obligations of each, and treat the other as they ask to be treated. The advent of the dealer has made the manufacturer more independent, and has given him more time to attend strictly to the business of producing than formerly, while the dealer, being free from the perplexity of manufacturing, can select stock at will and conduct his business in the most economical manner consistent with a successful introduction of his goods.

Criminal Economy.

As the daily reports of accidents from runaway horses reach us we are reminded of the mistaken economy of so many carriage owners who, while willing to pay a good price for a well made and finely finished vehicle and team, buy the harness as though it was of little or no importance, and haggle over a few dollars in cost, notwithstanding they risk physical injury and sometimes death by so doing. We read of runaway horses and injury to riders, due to a broken rein, trace, or bit, and we feel that ninety-nine times out of a hundred the buyer has selected his harness without the slightest regard to the importance of these parts. With a stout bit and strong reins a broken trace will cause trouble, but a serious accident can be avoided, while a broken bit or rein means disaster, yet men will choose the 50 cent cast bit and the cheap rein, rather than pay a dollar or two for a wrought bit, and five dollars for strong reins and hand parts. The retailer of harness knows the danger from weak straps, and prefers to sell those that are reliable, but the buyer too often insists upon the purchase of the cheap article, and he is fortunate indeed if he does not pay a severe penalty for so doing. Carriage dealers who sell harness, and nearly all do, should study the harness as closely as they do the vehicle, and thus be able to caution their customers against possible

danger. Throwing in a harness as a chromo is giving the buyer the easiest means for destroying the vehicle and injuring himself. It is much like giving a child a loaded pistol as a plaything.



Speeding Wagon Illustrations.

IN this number of THE HUB we present our readers with a collection of illustrations of light speeding and road wagons, such as has never before been given in any one publication. The six Fashion Plates all represent distinctive features, while the plates showing horses, harness and vehicles give a still further idea of the extent of styles of these light vehicles. The impetus given to speeding for pleasure by the opening of the New York speedway is spreading, and it will not be many years before all of our large cities will have similar drives, where gentlemen can speed their horses without fear of disaster from rough pavings or cumbersome vehicles, and carriage builders will be called to furnish these light wagons in great numbers. Because of this THE HUB makes this midsummer number a special light vehicle album, believing that better results can be reached by thus grouping a goodly number of styles than by scattering them through a series of numbers, but it does not mean that no others will be published. On the contrary, we recognize the fact that now is the time for carriage builders to look to the construction of these light vehicles, and just as rapidly as new features are suggested will we furnish them to our readers. But we think all will agree with us that this is a good beginning, and that in connection with our detailed account of speed wagons, their styles and construction, on another page, the builder will have a good base to begin upon, and at the same time he can feel assured that just so soon as he gets in shape to want more THE HUB will be on hand with whatever is new and desirable.



Choosing a Calling.

We print in another column an extract from an address by Professor Patton before the students of Princeton College, on June 10, baccalaureate Sunday, the subject being choosing a calling. What the president said to the students bears with equal force on young men entering any sphere in life. It applies to the young mechanic as well as to the young professor. Every day's result enforces more and more the power of trained thought. The iron machine is daily being made to do more of what was once performed by physical labor, and man is being divided into two classes, the one in which the brain works out the problem, the other where the hand guides the machine. The young man who aspires to a high position must select a calling and fit himself for a place in the first class. He whose aspirations reach no higher than ability to earn sufficient to supply his daily wants will join the second, and his life's work will end where it began. He will guide the lever, and the machine will perform the work. Notwithstanding the great opportunities offered for study there is a steady decrease in the number of mechanics and an increase in those who have no fixed calling or aim in life. The disgraceful riots caused by strikes are due in great part to the presence of so many men who have never fitted themselves for positions above the day laborer, and who, because of their own helplessness, allow a few unscrupulous leaders to direct their every action and decide upon their hours of work and rate of compensation. We advise our young men to read what President Patton says, and to act upon the advice given.

From the Philippines.

WE desire to call attention to our special correspondence from the Philippines, published in another column. The writer has been a contributor to THE HUB for several years, and his articles have always shown a mastery of the subject he treated upon, and his letter therefore deserves careful perusal. It is one of the kind that gives reliable information of a practical character. Our so-called anti-imperialistic friends may not favor the control of these islands by our government, but even they should welcome any step taken to improve the condition of the people, and to give to them the benefits of modern conveniences and comforts. As this is the first communication from these far away islands that treats on the possibilities of the carriage, we specially commend it to the attention of our readers.

OFFICIAL NOTICE.

TWENTY-EIGHTH ANNUAL CONVENTION, 1872—1900.

OFFICE OF THE SECRETARY,
WILMINGTON, DEL., June 1, 1900.

To the Members of the Carriage Builders' National Association of the United States:

THE twenty-eighth annual meeting of this association will be held in New York during the week commencing October 15, 1900.

At the same time and place the annual exhibition of parts of vehicles, automobiles, models, new inventions, harness, horse equipments and materials pertaining to the carriage, wagon and accessory industries will be held.

For the exhibition purpose the executive committee has engaged St. Nicholas Hall, Columbus avenue and Sixty-sixth street. This hall is on the second floor, with a wide and easy entrance. It is large—20,000 square feet of floor space—well lighted, and accessible from all parts of New York by elevated or trolley cars; both the Sixth avenue and Ninth avenue elevated railroads have a station at Sixty-sixth street, just at the door, and the Broadway and the Broadway-Columbus avenue street cars pass near the entrance. Other street cars pass within a few minutes' walk of the hall.

With a nearly square room, and plenty of light, every exhibitor will be assured of a good locality and have ample room to show his goods.

The following rules and regulations have been adopted to govern the exhibition:

Exhibitors must be either active or associate members of the association.

The exhibitions must be confined to models or parts of vehicles, or to materials used in the construction of the same, or to coachmen's outfits, harness and horse furnishings. No finished vehicle will be admitted.

No definite location can be allotted to any exhibitor on receipt of application; the space will be allotted in the order applications are received. Those making early application to the secretary will secure what advantage in location there may be, and also avoid the delay in securing their space on the day of opening. Ample room, however, will be furnished to all.

Each exhibitor will be expected to arrange and care for his own exhibit, and the committee assumes no responsibility whatever.

Exhibits can be placed in position on Monday, October 15, and must be removed on Saturday, the 20th, thus affording six full days for business.

The exhibit hall will be open continuously from 8 A. M. until 6 P. M. during the week, and on Tuesday night, October 16, and Wednesday night, October 17, the hall will be open until 9 o'clock, so as to allow time for those employed during the day to visit the exhibition in the evening, thus affording exhibitors every opportunity to display goods and transact business.

The hall will be laid off to accommodate all the exhibits, in such a way that each exhibitor may obtain the kind of space he needs. The rates for floor and table space will be as follows:

4 x 4 feet—16 feet....\$ 5.00	8 x 20 feet—160 feet....\$ 50.00
4 x 6 feet—24 feet.... 8.00	8 x 24 feet—192 feet.... 60.00
4 x 8 feet—32 feet.... 10.00	8 x 28 feet—224 feet.... 70.00
4 x 12 feet—48 feet.... 15.00	8 x 32 feet—256 feet.... 80.00
8 x 8 feet—64 feet.... 20.00	8 x 38 feet—304 feet.... 90.00
8 x 12 feet—96 feet.... 30.00	8 x 42 feet—336 feet.... 100.00
8 x 16 feet—128 feet.... 40.00	8 x 46 feet—368 feet.... 110.00
	8 x 50 feet—400 feet....\$120.00

Wall space will be sold by the linear foot in multiples of four feet, at the rates quoted above. This space is sold by the linear foot along the base of the wall, and projecting a sufficient distance from the wall as in the judgment of the superintendent shall give the exhibitor ample room for his purpose.

The height against the wall will be governed by the conditions of the building.

Application for space should be made to the secretary now, and should state the nature of the exhibit, dimensions of space required, and whether table, floor or wall space; and each application must be accompanied by cash payment for the space called for, at the rates named herein; or, if the exhibitors prefer, one-half of the amount may be paid by August 1, and the balance by October 1. Receipts for same will be returned by the secretary, and said receipts will be received as voucher for space, when presented to the superintendent at the hall.

We would suggest that goods sent for the exhibition should, if possible, be sent by express, prepaid, marked in the owner's name, for C. B. N. A. Exhibit, St. Nicholas Rink, 69 West Sixty-sixth street, New York.

Sending by express may cost a little more than by regular freight, but the shipper would be sure of having his goods delivered at once. For bulky exhibits, too large to send by express, arrangements will be made with a transfer company to haul them from the freight stations direct to the hall.

Don't forget to prepay the expressage or freight, so as to prevent delay in the delivering of goods.

The executive committee will appoint a "special committee on exhibition," to examine the exhibits and make report to the convention of such articles as show improvement in their special lines, or show a high order of inventive ability.

By resolution passed at the annual meeting, held in New Haven, it is required that any firm or company wishing to exhibit goods at the convention, should have at least one of its partners or officers a member of the association; and the fact that a representative or employee is a member will not alone be sufficient.

EXTRACTS FROM THE CONSTITUTION.

"The members of this association shall be persons engaged in the manufacture of carriages or sleighs for pleasure or for freight.

"Associate members may be elected from any trade or profession pertaining to the carriage trade, upon the payment of dues and fees prescribed by the by-laws, which shall entitle them to all the privileges of the association (including the annual dinner), except a vote."

EXTRACTS FROM THE BY-LAWS.

"The initiation fee of active members shall be \$5, and that of associate members, \$10. The annual dues shall be \$5, payable in advance."

Applications for membership should be addressed to Henry C. McLearn, Secretary, Wilmington, Del.

HENRY C. McLEARN, Secretary,
Wilmington, Del.

By order of the Executive Committee of the
Carriage Builders' National Association.

WAGON MAKERS' ASSOCIATION.

THE National Wagon Makers' Association met in Louisville, Ky., on Wednesday, June 27. The meeting lasted two days. More than 100 delegates, with their wives and families, were present. Wednesday was devoted to business, and Thursday to pleasure and sight-seeing. President W. C. Nones, of the Kentucky Wagon Co., looked after the social entertainment of the guests. One of the most important matters which came before the meeting was that of prices for wagons for the coming year. After a lengthy debate, it was decided not to advance prices.

Description of Latest Styles.

SPEEDING WAGON, WITH CUT DOWN FRONT.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 473.)

FASHION PLATE No. 473 illustrates one of the lightest styles of speeding wagons. The body is attached to the gear without springs or side bars. Stirrups are placed outside of the body at the front, for the driver's feet to rest in.

Dimensions of Woodwork.—Body, length, 54 in.; width across top, outside, $16\frac{1}{2}$ in.; across bottom, 16 in. Width of seat across top, 21 in.; across bottom, 18 in. Wheels, wire. Height, front, 28 in.; rear, 28 in. Tires, $1\frac{1}{2}$ in., pneumatic. Track, 3 ft. 10 in. Distance between center of axles, 43 in.

Painting.—Body, black, without striping. Gear, coach red. Steps, etc., black. Trimming, cushion and back rest, gray whipcord.

SPEEDING WAGON, WITH SKELETON SEAT RISER.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 474.)

FASHION PLATE No. 474 illustrates a wagon with low side panels and a cutdown front, the seat being set upon a wood riser in front and iron legs at the back. The seat is a bent rail spindle.

Dimensions of Woodwork.—Body, length, 53 in.; width across outside, 15 in. Width of seat across top, 20 in.; across bottom, 17 in. Wheels, wood hub. Height, front, 28 in.; rear, 30 in. Hubs, length, 5 in.; diameter at center, $2\frac{1}{2}$ in.; front end, $1\frac{3}{4}$ in.; back end, $2\frac{1}{4}$ in. Size of spokes, $\frac{3}{4}$ in. Number of spokes, 12 and 12. Stagger, $\frac{3}{4}$ in. Depth of bands, front, $1\frac{1}{2}$ in.; back, $\frac{5}{8}$ in. Distance between center of axles, 47 in. Tires, $1\frac{1}{2}$ in., pneumatic. Track, 3 ft. 10 in., outside.

Painting.—Body, dark green. Gear, orange, striped black. Trimming, maroon cloth.

SPEEDING WAGON, WITH SPINDLE BODY AND SEAT.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 475.)

FASHION PLATE No. 475 illustrates a speeding wagon with the body made up with a row of spindles all around back of the front seat post, the seat being made up in the same style. The seat riser panel is done away with, and the seat is supported by the two posts and iron legs.

Dimensions of Woodwork.—Body, length, 54 in.; width across top, outside, 15 in.; across bottom, 14 in. Width of seat across top, 19 in.; across bottom, 16 in. Wheels, wire. Height, front and rear, 28 in. Tires, $1\frac{1}{2}$ in., pneumatic. Track, 3 ft. 8 in., outside. Distance between center of axles, 45 in.

Painting.—Body, black, fine lined with red. Gear, carmine and black. Trimming, whipcord.

SPEEDING WAGON, WITH CORNING BODY AND SKELETON RISER.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 476.)

FASHION PLATE No. 476 illustrates a speeding wagon with body after the "Corning" form, but without seat riser panels. The body is hung upon side bars and cross springs. The seat is made up like a coach seat, only that the rail is much lighter.

Dimensions of Woodwork.—Body, length, 55 in.; width across outside, 16 in.; width of seat outside, 18 in. Wheels, wood hub. Height, front, 28 in.; rear, 30 in. Hubs, length, 5 in.; diameter at center, $2\frac{1}{2}$ in.; front end, $1\frac{3}{4}$ in.; back end, $2\frac{1}{4}$ in. Size of spokes, $\frac{3}{4}$ in. Number of spokes, 12 and 12. Stagger, $\frac{3}{4}$ in. Distance between center of axles, 54 in. Tire, $1\frac{1}{2}$ in., pneumatic. Track, outside, 3 ft. 10 in.

Dimensions of Ironwork.—Springs, 18 in. long between centers of heads, with $2\frac{1}{2}$ in. opening on main leaf. Width of steel, $1\frac{1}{4}$ in. Number of plates, 4. Thickness, No. 5 steel.

Painting.—Body, dark lake. Gear, coach red and black. Trimming, maroon cloth.

SPEEDING WAGON, WITH LOW SIDE PIANO BOX BODY.

(See Fashion Plate No. 477.)

Scale, $\frac{5}{8}$ inch to the foot.

FASHION PLATE No. 477 illustrates a speeding wagon with a low side piano box body, suspended on side bars and cross springs, the seat being a solid panel the same as the regulation road wagon. The gear has wire wheels, with pneumatic tires.

Dimensions of Woodwork.—Body, length, 54 in.; width across top, $14\frac{1}{2}$ in.; across bottom, 14 in. Width of seat across top, 20 in.; across bottom, 16 in. Wheels, wire, height, front, 26 in.; rear, 28 in. Distance between center of axles, 49 in. Tires, $1\frac{1}{2}$ in., pneumatic. Track, outside, 3 ft. 8 in.

Dimensions of Ironwork.—Springs, 17 in. long between centers of heads, with 2 in. opening on main leaf. Width of steel, $1\frac{1}{4}$ in. Number of plates, 3. Thickness, No. 5 steel.

Painting.—Body, black, no striping. Gear, carmine and black. Trimming, whipcord.

SPEEDING WAGON, WITH PIANO BODY AND STICK SEAT.

Scale, $\frac{5}{8}$ inch to the foot.

(See Fashion Plate No. 478.)

FASHION PLATE No. 478 illustrates a speeding wagon with low side piano body and plain spindle seat, suspended on a skeleton gear and wood wheels.

Dimensions of Woodwork.—Body, length, 52 in.; width across top, $18\frac{1}{2}$ in.; across bottom, 18 in. Width of seat across top, 22 in.; across bottom, 19 in. Wheels, wood hub. Height, front, 28 in.; rear, 30 in. Hubs, length, 5 in.; diameter at center, $2\frac{1}{2}$ in.; front end, $1\frac{3}{4}$ in.; back end, $2\frac{1}{4}$ in. Size of spokes, $\frac{3}{4}$ in. Number of spokes, 12 and 12. Stagger, $\frac{3}{4}$ in. Depth of bands, front, $1\frac{1}{2}$ in.; back, $\frac{5}{8}$ in. Distance between center of axles, 55 in. Tire, $1\frac{1}{2}$ in., pneumatic. Track, 4 ft. outside.

Dimensions of Ironwork.—Springs, 20 in. long between centers of heads, with $2\frac{1}{2}$ in. opening on main leaf. Width of steel, $1\frac{1}{4}$ in. Number of plates, 4. Thickness, No. 5 steel.

Painting.—Body, dark green. Gear, green and black. Trimming, green cloth.

DROP CENTER MILK WAGON.

(See "Latest Styles.")

PLATE LIII. illustrates the drop-center milk wagon manufactured by the Hoover Wagon Co., York, Pa., which has proved to be a most acceptable vehicle. The body is 7 ft. long by 3 ft. wide, outside measure. Has space inside for six 40 quart cans, and also for small cans under seat. Made with drop glass frame in front, with sliding doors at side. Made full panel, or part panel and part glass, as shown in cut. Axle and tire, $1\frac{1}{2}$ in. Springs, elliptic all around, $1\frac{1}{2}$ in. by 4 plate in front and back; front spring, 30 in. long; back, 36 in. long. Made with shafts to attach to axle, and short turn gear, making the most complete wagon of the kind on the market. Hangs low, being but 20 in. from the ground; can be turned on 20 ft. space. Painting, body, cream and sulphur color; gear, straw color; nicely striped and ornamented.

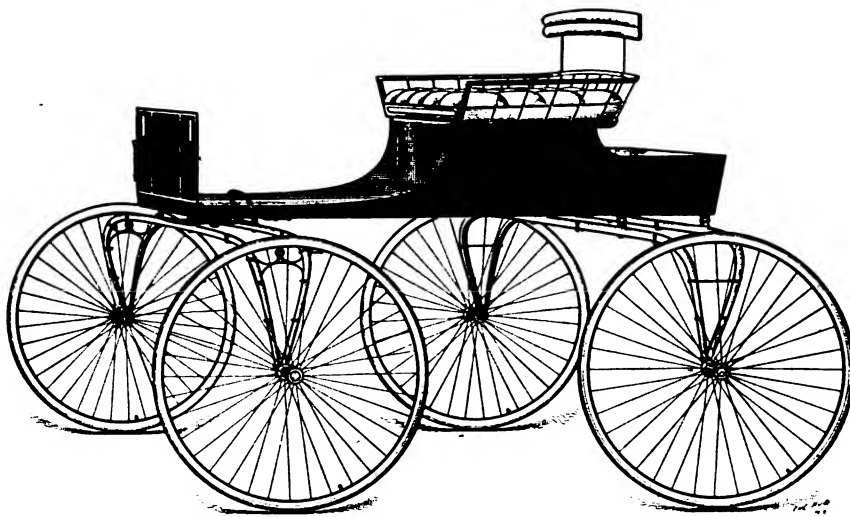
EXTENSION TOP CUTUNDER SURREY.

(See "Latest Styles.")

PLATE LIV. illustrates the Brighton Buggy Co.'s No. 96 extension top cutunder surrey, which in point of symmetry, style and finish is one of the handsomest of their 1900 styles. This commodious surrey is fitted up with long distance dust proof collar axles, screwed rim wheels, lightning shaft couplers, Staples & Hanford spring cushions and spring backs. The upholstery is of 16 oz. wool dyed cloth or machine buffed leather. The address of the company is Cincinnati, O.

(Continued on page 187.)

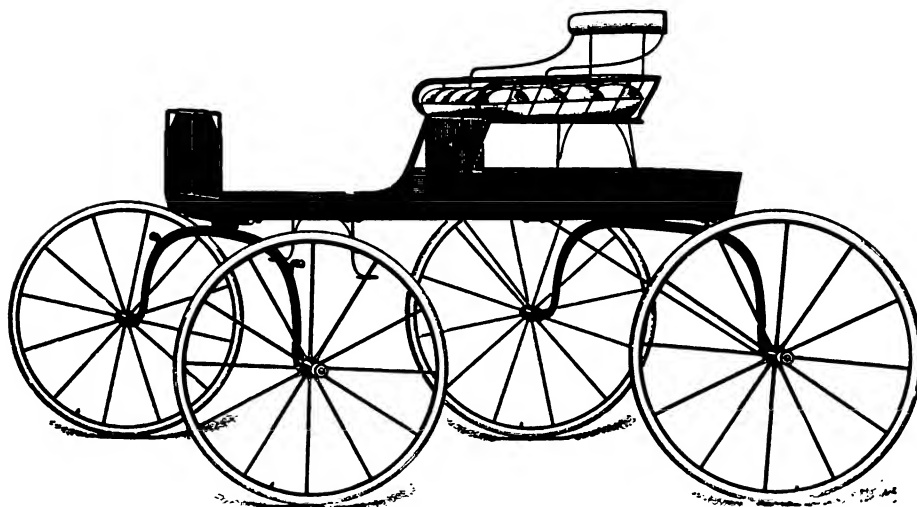
Latest Styles. July, 1900



No. 473. SPEEDING WAGON, WITH CUT DOWN FRONT. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

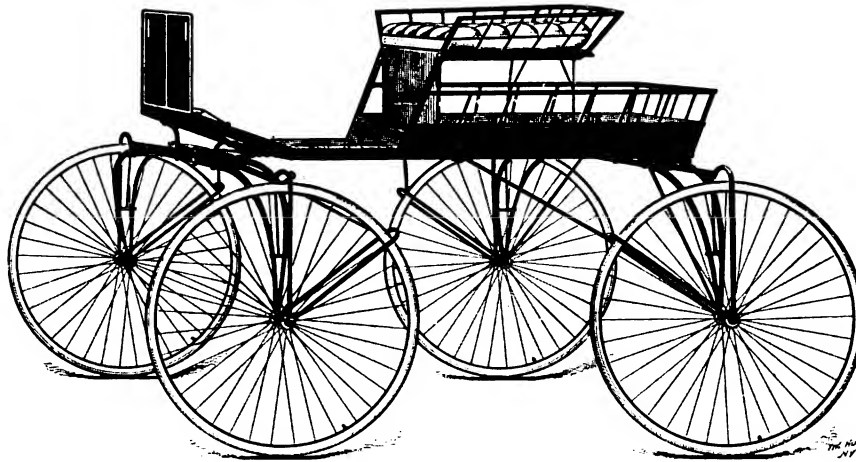
(Electrotype, \$1.25.)



No. 474. SPEEDING WAGON, WITH SKELETON SEAT RISER. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

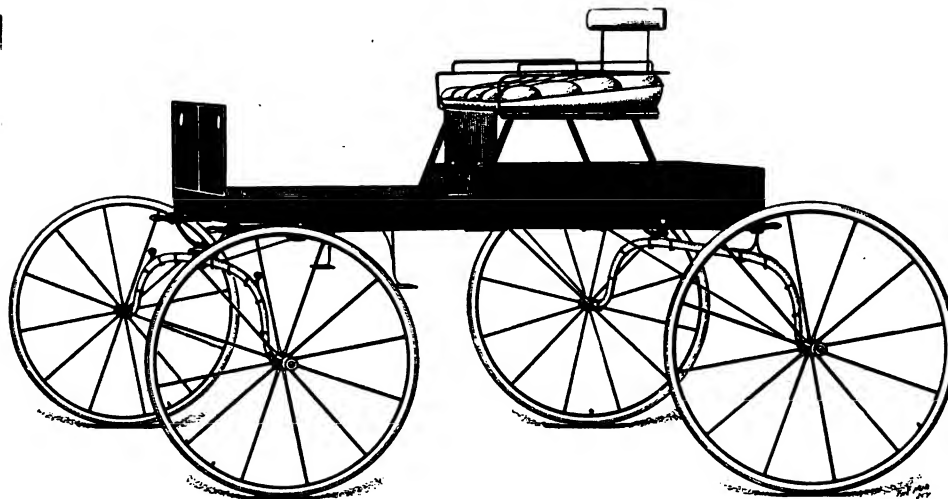
(Electrotype, \$1.25.)



No. 475. SPEEDING WAGON, WITH SPINDLE BODY AND SEAT. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

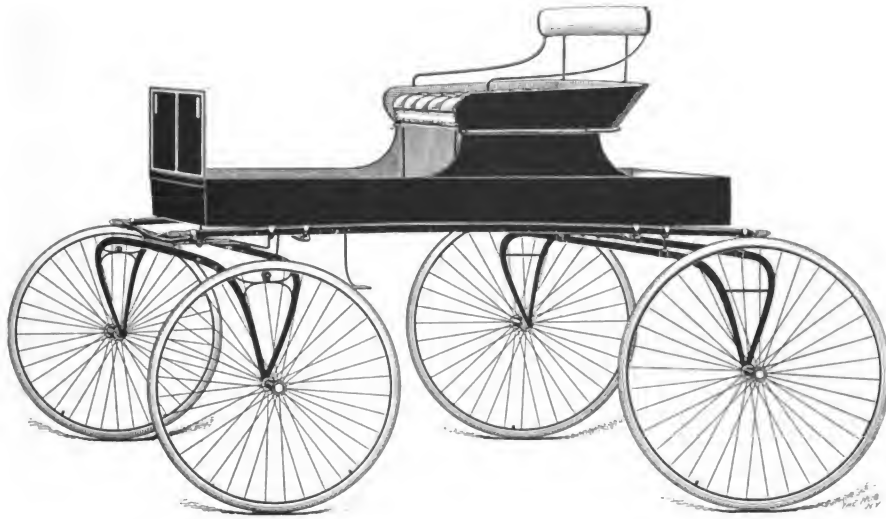
(Electrotype, \$1.25.)



No. 476 SPEEDING WAGON, WITH CORNING BODY, SKELETON RISER. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

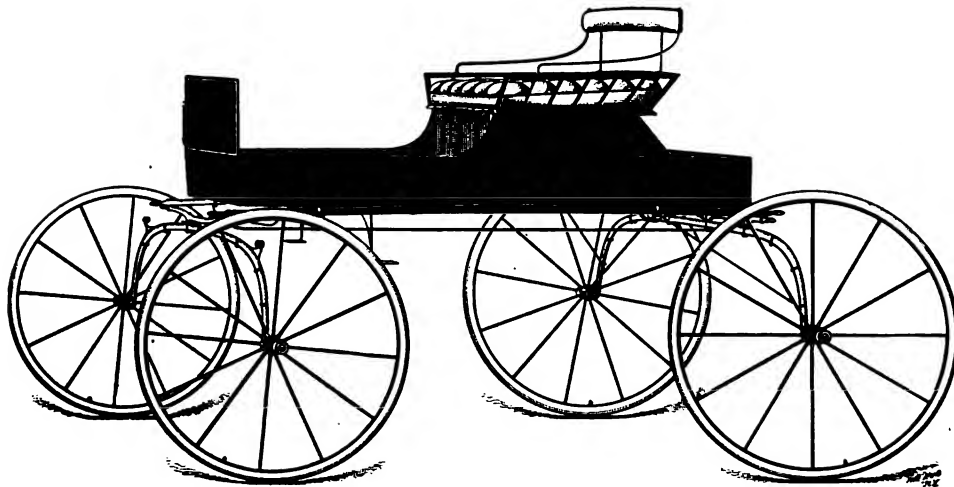
(Electrotype, \$1.25.)



No. 477. SPEEDING WAGON, WITH LOW SIDE PIANO BODY. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

(Electrotype, \$1.25.)



No. 478. SPEEDING WAGON, WITH PIANO BODY AND STICK SEAT. Scale, Five-eighth Inch to the Foot.

See description under "Latest Styles" in this number.

(Electrotype, \$1.25.)



PLATE LIII. DROP CENTER MILK WAGON.

See description under "Latest Styles" in this number.

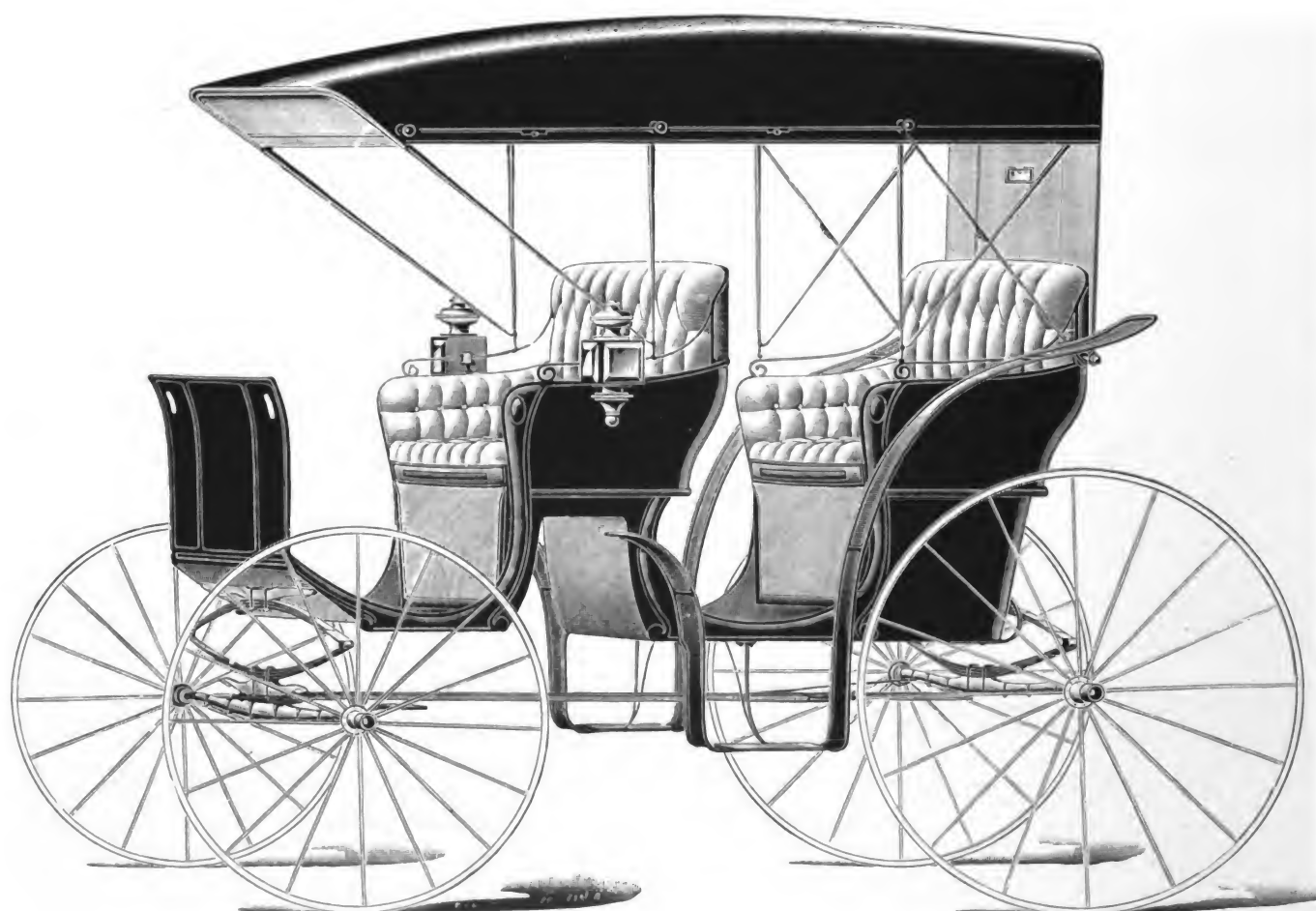


PLATE LIV. EXTENSION TOP CUTUNDER SURREY.

See description under "Latest Styles" in this number.



PLATE LV. SPEED WAGON.

See description under "Latest Styles" in this number.



PLATE LVI. PHAETON BIKE GEAR.

See description under "Latest Styles" in this number.

AUTOMOBILE ILLUSTRATIONS.**Phaeton.**

THE LOUTZKY
AUTOMOBILE SYSTEM.

(Patented.)

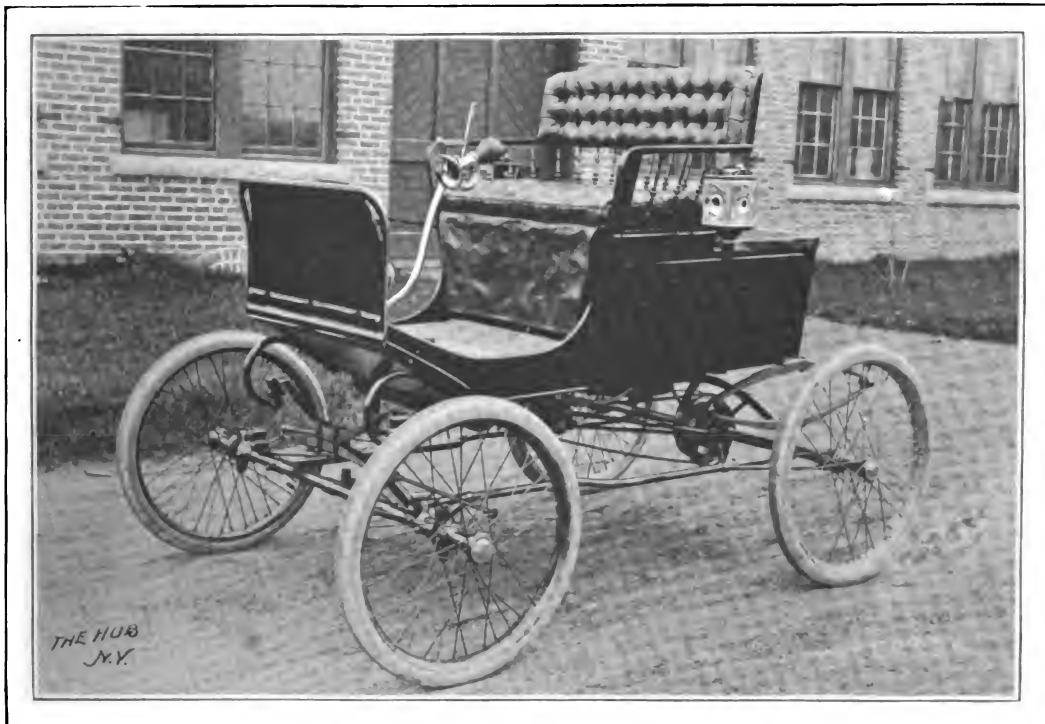
**Brougham.****Victoria.**

MANUFACTURED IN

BERLIN, GERMANY.

For description, see Automobile Department.

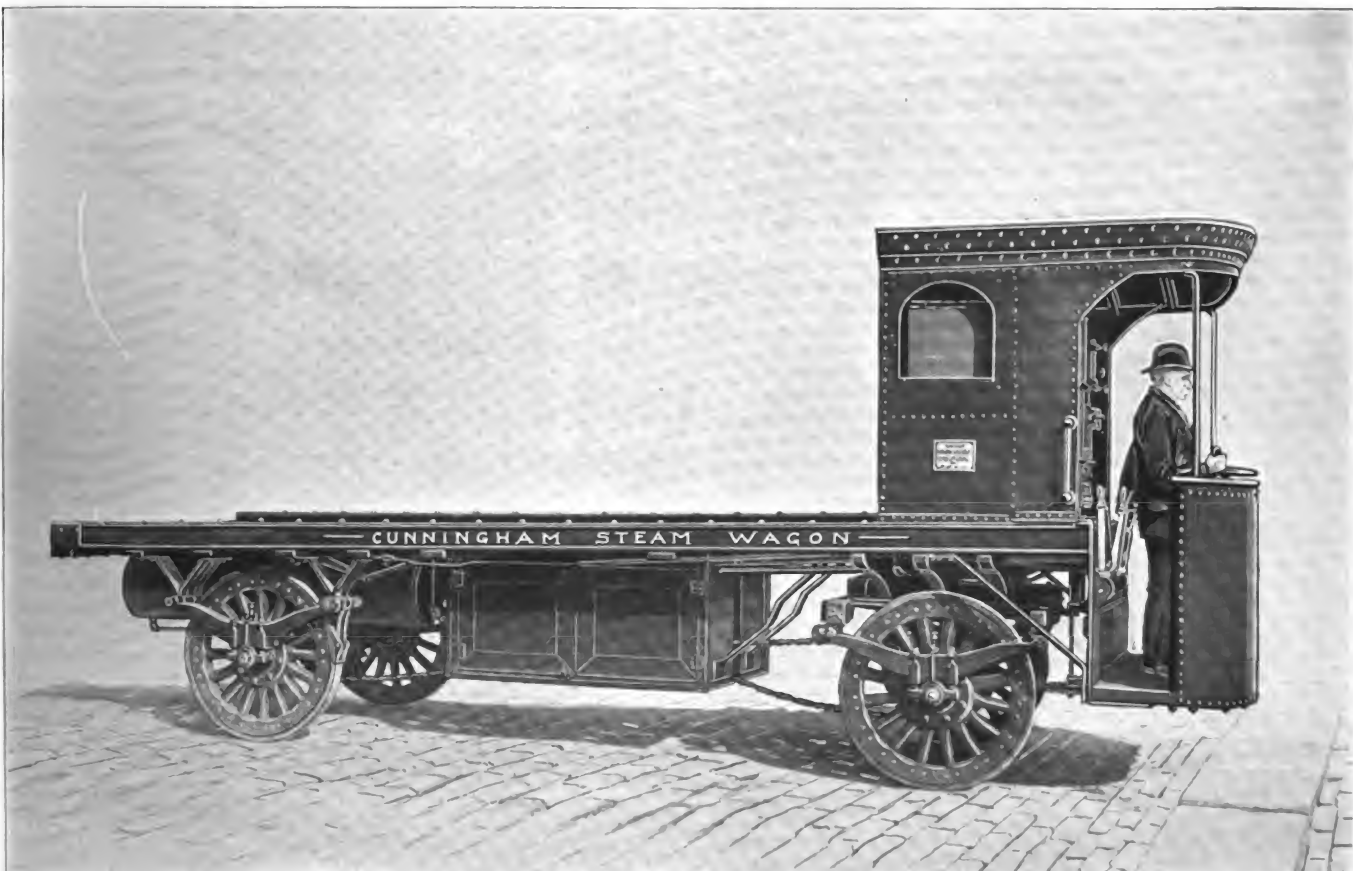
**Mail Wagon.**



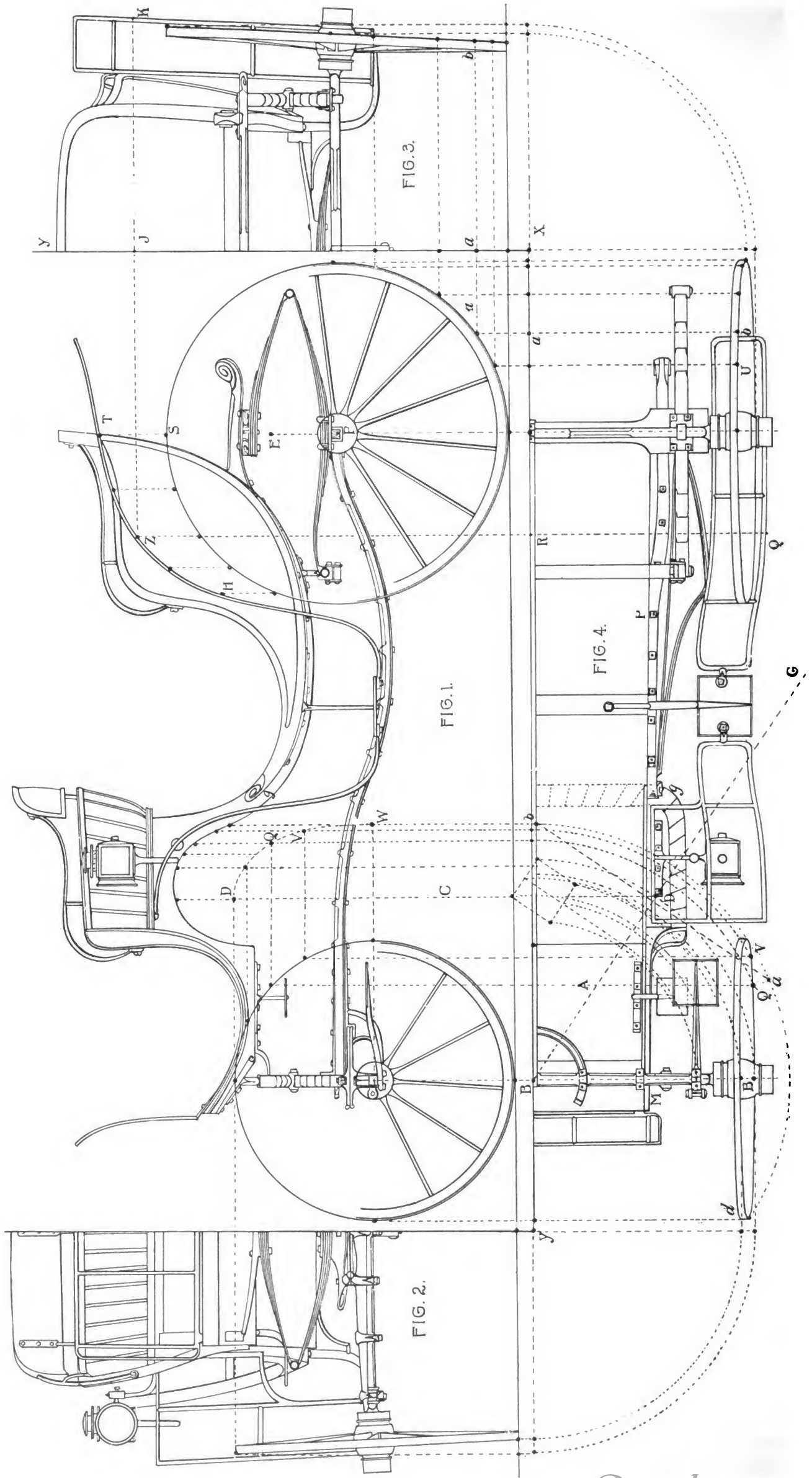
GROUT BROS.' SELF-PROPELLED VEHICLE. (For description, see Automobile Department.)

THE FRIEDMAN AUTOMOBILE.

For description, see Automobile Department.



THE CUNNINGHAM STEAM MOTOR. (For description, see Automobile Department.)



WORKING DRAWING OF A FAMILY CABRIOLET. SCALE, 1/4 INCH TO THE FOOT.

Wood Department.

WORKING DRAWING OF A FAMILY CABRIOLET.

Scale, $\frac{3}{4}$ inch to the foot.

THE working drawing on the opposite page represents a family cabriolet with three spring perch gear, mounted on a set of 38 in. and 46 in. wheels, having a 4 ft. 8 in. track, with height from the ground at the entrance to each seat of 35 in. and 27 in., which, when weighted with four riders, will settle to 32 in. and 24 in. respectively.

The distance between the centers of the front and back wheels is 7 ft. 4 in., which is larger than usual, as the body is 7 ft. 8 in., the difference being the extra space between the seats, which, to secure ample space and increase the comfort, is 27 in. This size vehicle is suitable for either single horse or a pair.

The science of making working drawings of the suspension of the body, the location of the springs and axles, is the subject of this article. We begin the work by drawing upon the side (Fig. 1) the periphery of the front wheel; second, its swing or inclination, as in Fig. 2, and from these two points find its projection in plan, Fig. 4, by indicating the center of the axle. We turn the wheel against the perch (locking the wheel) for the purpose of finding the arch of the wheel house, and with the dividers describe the path of the wheel from *d* to *b*, and the distance between *a* and *b* is the diameter of the wheel, while the position of the locked wheel, when backed against the perch, is shown by the straight line. Dissect the line *a b*, the rim of wheel, and from the center, *B*, draw the line *A G* at right angles to line *a b*, the rim of the wheel. If we take the distance *B B*, Fig. 4, and describe this to the straight line *A G*, we will have the point *D*, the swing of the wheel. If from this intersection we erect the vertical line, *C*, we will then have this point projected upon the side elevation at the height *D*, Fig. 1. Here we have fixed on the rim of the wheel in Fig. 4 five points, which when dropped to the rim of the wheel in Fig. 4, and then arched to the center, *X Y*, and thence vertically to the side, where they will meet corresponding lines drawn horizontally, will form the side position of the wheel. We illustrate the principle involved by projecting two of these points, *V* and *Q*, which will serve to show the method for the other three. If when all are correctly stationed as per draft, and we then pass the curve *W* to *D*, Fig. 1, it will be the projection of the top quarter of the exterior edge of the tire, in elevation, according to the swing of the wheel, as inclined in Fig. 2, and thence projected in plan, Fig. 4, and by this means we are enabled to locate the arch of the wheel house over the position of the wheel, when locked against the perch, which could not be done accurately otherwise, neither can we make workable drawings of the body until this is first completed. We then determine the width of the rockers in plan to be 31 in., as indicated by *M P*, Fig. 4, and so shape the arch as to clear the passage of the wheel, the opening of the elliptic spring, which we can do mechanically, knowing the height of wheel, width of track, width of the body and the lock of the wheel. We then proceed with the design of the front seat, the shape and proportions of which depend largely upon the taste and experience of the workman. The measurements which determine the dimensions of the front seat are obtained by rules familiar to the body maker. The depth of the rocker over the wheel and under the seat is $2\frac{3}{4}$ in. The height of the seat above the bottom boards is $14\frac{1}{2}$ in.; depth of seat frame, 18 in.; leg room, 24 in., but, as already stated, we determine all of this practically from the arch of the wheel house. We then measure down, instead of commencing at the bottom and working up; thus we see that the height of wheel, width of track and passage of the wheel about the center, *B*, determine the poise and the position of the seat, and, consequently, the whole front of the body.

The lines of the back quarter have much to do with the appearance of the carriage, as there are many shapes for this style of bodies. We begin by first fixing upon the side the point of height for the bottom of the rocker at its lowest point, the entrance to the seat as that of 27 in. from floor line, knowing that the springs will settle, reducing the distance from the ground to 24 in., the height we wish the bottom of the body to have when weighted with its complement of four riders. The position of the rear axle is

most always determined by two conditions, that of room for the wing in front of the wheel, and the elbows of the body. Assuming that the design of the back will be shaped as shown, we draw the hind wheel, set up the spring, allowing for a spring bar on the top for the pump handle, and box this into the bottomside and not to the rocker; it will then come inside of the springs. We calculate for the cross spring and then draw the perch to clear the bottom of the cross spring a distance of 6 in., guided by the lower outline of the rocker. Here the center of the axle is vertically under the elbow, or the back of the body. The wings are shaped alike at the lower parts each side of the step. We determine the trace of the edge of the wing over the hind wheel by locating the position of the step, then erecting a line from the center of the step up to the height of the front seat frame and measuring each way to get both edges alike. We plan the front wing to pass the volute, *G*, Fig. 1, and not to cross it, also avoid running along the lower edge of the rocker and thus prevent confusing the lines. The bolt for the wing at the top, which passes through the rocker and plate, is made solid with the frame and is secured by a nut, the bottom end of the wing being bolted to the step.

We determine the shape of the wing by erecting several vertical lines, *S T*, Fig. 1, from the tire of the hind wheel, whose length should exceed the opening of the hind spring, which is 9 in., to allow for both jounce and the side sway of the body. Then from the center of the axle, from *P* to *E*, take half the diameter of the wheel, and from *E* as the center describe the curve of the wing over, and in front of, the wheel, and it will pass through the points thus measured from the tire of the wheel, but for convenience when working we make a pattern of the whole length of the wing, which will intersect the five points from *H* to *T*.

The lateral position of the wing in relation to the wheel is shown in the back view, Fig. 3. The exterior edge is parallel to the swing of the tire of the wheel, and 1 in. outside of it, and since the wing is curved in the side elevation and inclined in the back elevation, its trace in plan will be a curve. If we take the distance at several points on the edge of the wing, from the center, and carry them to the plan, Fig. 4, it will establish their trace upon the horizontal plane. One point taken at the height *J* will illustrate the meaning of this. If from the point *Z*, Fig. 1, we carry a line horizontally across to the edge of the wing, as in Fig. 3, and from *Z* vertically to the horizontal plane, we will have moved this joint into the position of *J. K.* Fig. 3, and *R Q*, Fig. 4. The distance *J K* is equal to *R Q*; at this point the wing is the same width in each plane, and the same distance from their respective centers. Should we take a number of points of projection, each point would fall on the edge of the wing in plan as described above; in making the drawings this was done. We see from this that a curved line when inclined will cast a curved trace in plan.

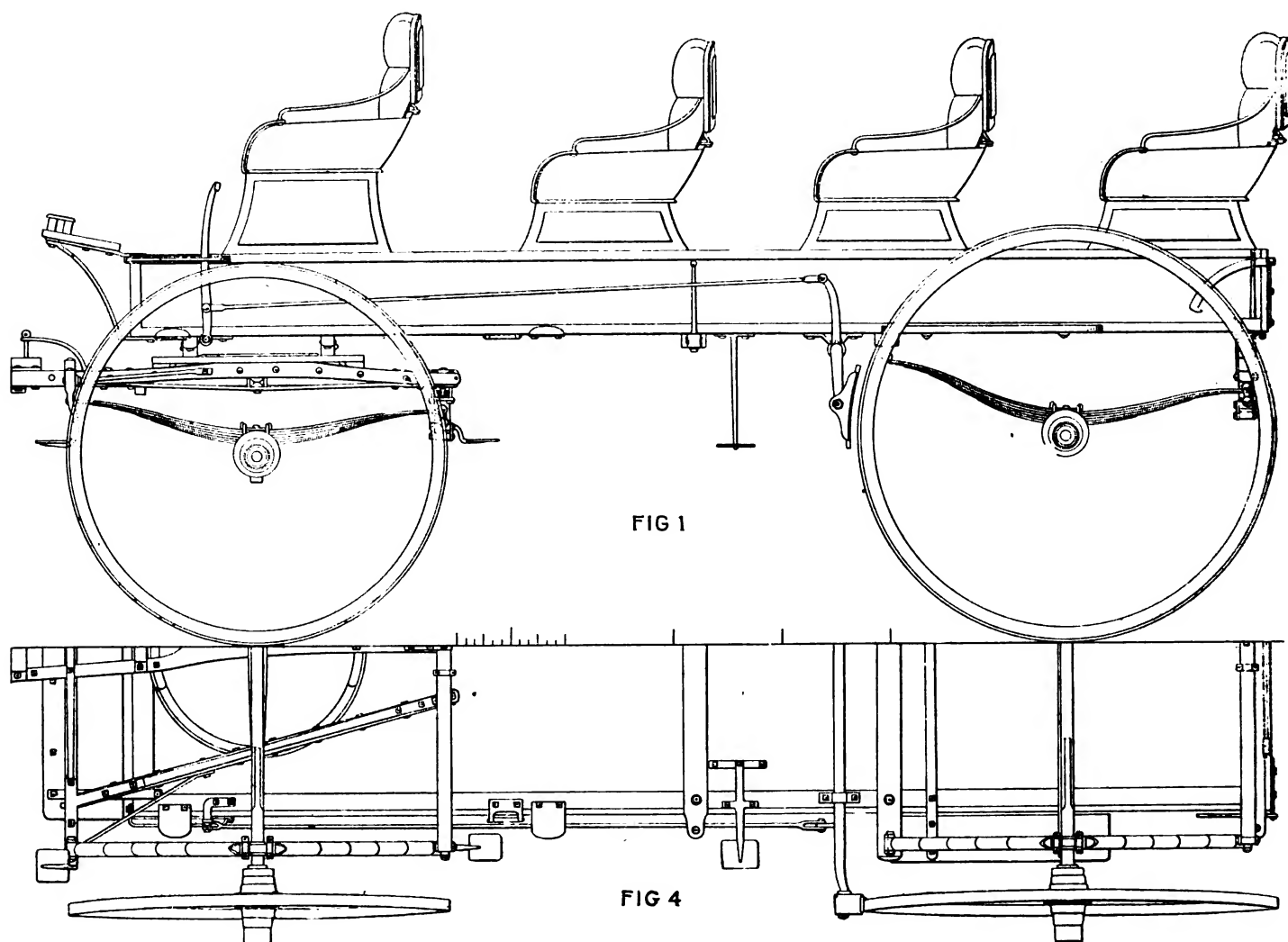
The same result will be obtained with the trace of the hind wheel, as projected in plan, Fig. 4. Here we set off six points of the lower quarter section of the rim of wheel, and carry these points across and down to the vertical and horizontal planes, and take the distance from the vertical center, *X Y*, Fig. 3, over the points marked on the rim of the wheel, and carry each point to its proper position in the plan, and through each point thus obtained pass the trace *U*, which indicates the exterior edge of the tire corresponding in width to that of the inclination in the elevation, Fig. 3. If at the height *a*, Figs. 1 and 3, we take the distance *a b*, Fig. 3, and carry this from *a* to *b*, Fig. 4, it gives the projection of one point, and shows the principle on which we work and the manner of establishing in plan the curved edges of the wings and wheels, and becomes of great importance to the practical worker on full size drawings.

The dimensions of the wheels, axles and springs are as follows: Height of wheels, 38 and 46 in.; size of hubs, 7 by $4\frac{3}{4}$, and 5 in., the back hub being $\frac{1}{4}$ in. larger than the front; number of spokes, twelve and fourteen; size, $1\frac{1}{4}$ by 1 in.; point band, 4 by 2 in.; back band, $4\frac{1}{2}$ by $\frac{7}{8}$ in.; track, 4 ft., 8 in.; spread of back springs, outside, $42\frac{1}{2}$ in.; front axle, fantail, size at collar, 1-16 in.; size in center, $1\frac{1}{2}$ by $\frac{7}{8}$ in.; hind axle, coached, size at collar, $1\frac{1}{8}$ in.; center, $1\frac{1}{4}$ in.; front elliptic spring, 38 in. long, 10 in. high, $1\frac{1}{2}$ in. wide, five plates, Nos. 2, 2, 3, 3 and 4 steel, plates oval on top, ends round, and ground light at the edges; rear springs, three-quarter elliptic and cross; length of side, 38 in., 11 in. high, $1\frac{1}{2}$ in. wide, five plates, Nos. 2, 3, 3, 3 and 4 steel, finished as above described; length of cross spring, $41\frac{1}{2}$ in., arched $3\frac{1}{2}$ in. on main plate, $1\frac{1}{2}$ in. wide, five plates, Nos. 2, 2, 3, 3 and 4 steel, and finished the same as the elliptic; tire, $1\frac{1}{8}$ in. by 5-16 in. thick; depths of rim, $1\frac{1}{4}$ in.

The European carriage makers seem to think that we use the perch to pull the hind wheels along, but such is not the case. In a three spring perch gear we employ the perch to steady the front axle, spring and fifth wheel, and of late some of the eastern builders are dispensing with the side stays from the perch to the rear axle, noticeably on rockaways, and in view of this we dispense with them here, as the hind springs will support the strain as they do in broughams and coaches, and since the use of rubber tires has become so general on all kinds of carriages the friction from the wheel against the perch is reduced to a half of what it would be with steel tires. For the above reasons it is safe to dispense with side stays on a three spring perch carriage. The plan of this design will show that the step will pass under the perch when the wheel is backed against the roller chafe iron. The manner of reaching the step into the position under the perch is plainly shown, and needs no special mention. The perch is bent of $1\frac{1}{4}$ in. white ash, and is plated top

sections where summer boarders are taken. It has the merit of capacity, strength and moderate cost—requisites not to be overlooked in connection with this class of vehicles. The working drawing gives a clear idea of the style of platform gear used, and the manner of hanging off the back end of the body. With wagons of this kind the brake is an important factor. This is shown clearly in the drawing. Fig. 1, the side elevation, shows the hanging of the body, the location of the brake, and the general appearance of the completed vehicle.

Fig. 2, one half view of the front end, shows drop of axle, location of springs, form of drawbar, brake handle, flare of body and front seat. Fig. 3, one-half view of the rear end of the body, showing location of spring, cross spring bar, ironwork of end board, rear of seat, etc. Fig. 4, the ground plan, gives all the under dimensions of one-half of the body, under side of gear, forming a complete working drawing of the vehicle, which, together with following dimensions, will serve to enable any builder to put up the job.



TWELVE PASSENGER PLATFORM WAGON.

and bottom; the top plate is swaged to a half round between bolt heads; the bottom plate is also swaged, but to a flatter round than that of the top. The coupling of the perch to the back axle is made in the usual way; the perch abuts the square center of the axle. The top plate crosses over and turns down, forming at the end a clip, the bolt of which passes through the end of the bottom plate, which forms the yoke. To prevent this clip from slipping sidewise the axle is burred or upset against the edges of the plates on both sides, which makes a secure fixture and in case of repair is difficult to remove.

TWELVE PASSENGER PLATFORM WAGON.

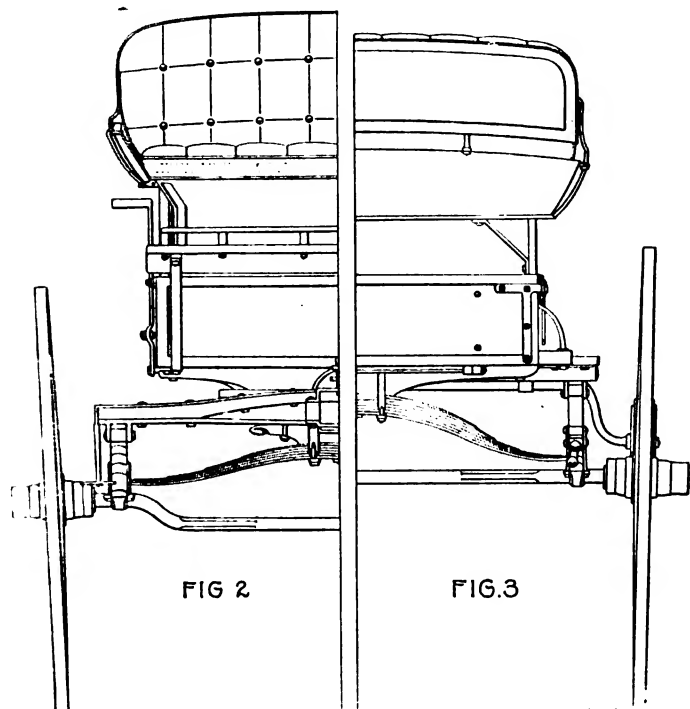
THE twelve passenger platform wagon shown above is drawn to the scale of $\frac{5}{8}$ in. to the foot, and the details are so complete that the drawing can be worked from with perfect safety. This class of vehicle has become a feature of country life, in those

Length of body, 10 ft. 6 in. Width, 3 ft. 1 in. Height of panel, 9 in. Seats, 17 x 41 in. on the bottom; risers, 6 in. high for the three rear seats, and 9 in. for the front seat. The upper backs are 44 x 10 in. Back standards, 22 in. apart. Foot board, 37 x 9 in. Walking board, 24 x 5 in. The long board step is parallel with the body, for passengers to get access to the rear seat. Wheels, 3 ft. 6 in., and 3 ft. 10 in. Hubs, rims, $1\frac{1}{4}$ in. square; $7\frac{3}{4}$ in. long. Point bands, 3 in. diameter, $1\frac{5}{8}$ in. long. Rear bands, $3\frac{1}{4}$ in. diameter, $\frac{3}{4}$ in. long. Forward point band, hexagonal. Tires, $1\frac{1}{8}$ in., round edge. The side springs, rear, are 40 in. long, center to center, 4 in. open, six leaves, $1\frac{1}{2}$ in. Main leaf, No. 2, all others No. 3 steel. Rear cross spring, 44 in. long, $4\frac{1}{2}$ in. open, seven leaves. Main plate, No. 2, all other plates, No. 3 steel.

The forward cross spring is 44 in. long, six leaves. Main plate, No. 2, all other plates, No. 3 steel. The forward side springs are of the same dimensions as the rear. The brake shaft is $1\frac{1}{2}$ in. round. Brake rod, $\frac{1}{2}$ in. round. Circle, 24 in. in diameter, and upper half flanged. Track, 4 ft. 8 in. Body from the ground, $34\frac{1}{4}$ in. and $34\frac{3}{4}$ in.

TREATMENT OF TIMBER IN THE SUMMER.

At no time in the year is care required in the workshop so much as during the hot months of July and August. The extreme heat makes the shop a most uncomfortable place, no matter how complete the ventilation, and as a result windows and doors are open night and day. This would be all right if the summer air was not so thoroughly charged with moisture. A dry heat might be more oppressive to the workmen than the moist, but it would be less injurious to the timber. It is the moisture that does the damage. We have seen whitewood boards eighteen inches wide, that fitted the place into which they were to be put, so swollen by the moist air during a summer night that they were $\frac{1}{8}$ of an inch too wide in the morning, and on being allowed to remain out during a hot day they shrunk back to the condition of the night before.



HALF FRONT VIEW AND HALF BACK VIEW OF A TWELVE PASSENGER PLATFORM WAGON.

The effect of a humid atmosphere is more marked on the softer woods than on the hard, but the latter, particularly ash, swell and shrink, as the air becomes humid or dry. This fact makes it necessary to guard against damages from the atmospheric conditions. To do this all framework should be glued together, if possible, before quitting work for the day, and where not possible it should be put into the dry room. In addition, windows and doors should be closed before nightfall, and wherever possible, the shop should be heated enough to lower the humidity to a normal condition. Carelessness in regard to this matter has caused many a split panel and warped piece of framework and has marked the lines of strainers on quarter and other panels, where backed up by supports of any kind.

The dry room is never more a necessity than during these two hot months. Wood under like exposure will shrink during the month of March, or even April, but will swell during the months of July and August. How plainly this is proven can be learned by examining wheels that were tired during the winter months, but which when stored in a room where the March winds reached them freely have shrunk so that the tires can be slipped off by hand, but if allowed to remain undisturbed until August the tires will be as tight as when they were first put on. These facts accentuate the importance of a uniform temperature for the woodshop. The winter conditions are the best, when the shop is heated to about 70°. Then there is no excess of moisture, nor is the air so heated as to dry the wood too much, and the nearer this condition obtains in the summer the better it will be for the workman and his product.

THE silence often of pure innocence persuades when speaking fails.—Shakespeare.

Smith Department.

THE SMITH SHOP.

FROM some unexplained cause, the blacksmith occupies the most uncomfortable position in the carriage shop. He is more often in the basement of the city shop than elsewhere, and in the country he occupies the worst lighted and least ventilated part of the factory; but this is not all; for even these shortcomings might be atoned for in part if the room was light and clean. As it is, a clean, well lighted smith shop is the exception. Dingy windows, smoked ceilings and dirty floors predominate, and the smith works away in this uninviting place, subjected to cold in winter and heat in the summer. A great improvement is noticeable in the location, lighting and ventilating of the smith shops in the large factories built in the last decade, but there remains much to be done in the great majority if the blacksmith is to be made as comfortable as his fellow workers in the other departments.

It is as much the fault of the smith as it is of the employers. He seems to think that black hands, dirt begrimed face, a dirty forge, cobwebbed windows and a floor covered with scraps of iron, old rubbish, coal dust, etc., are necessities. Without them he cannot pose as an old time follower of Tubal Cain, and if he chances to remove all the dirt, the smell of the forge and appears clean and neat on leaving the workshop, he fears to forfeit his right to be called an ironworker. There is no more excuse for a blacksmith being covered with dirt than there is for any other workman. All that is necessary is that the shop, be located where good ventilation is possible, and where the light is good and facilities for cleanliness are provided. Then keep the walls clean and white by using lime freely, and clean the forges and floors as frequently as they are cleaned in a well kept workshop.

We know that there are men who will laugh at this proposition, and will ridicule any workman who takes for his motto "cleanliness is next to godliness," but even they can be made to take pride in having clean faces and hands, if they see their fellow workers careful in this respect.

The duty of the employer is to provide a clean, well lighted shop, and to see that it is kept so. Then if he has a workman who is so careless as to appear dirtier than his surroundings, compel him to clean up or get out. By so doing he will improve the appearance and health of his workmen, and secure a grade of work above what he could hope for in a dirty, dust-begrimed, gas polluted smith shop.

WELDING—TO AVOID SPLITTING.

A FEW days since, while passing through a local smith shop and taking observations, we saw a young smith welding two flat pieces of iron together the whole length, except about 3 in. at one end. He did this as he had no iron of the requisite size for a clip king

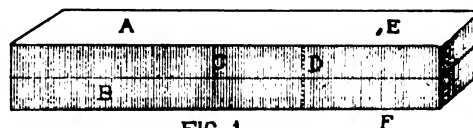


FIG. 1.

bolt for a business wagon, and welded the two bars together, leaving them unwelded at the end, expecting to turn off the two ends for the formation of the clip. He went through the welding process and then started to turn off the unwelded ends for the clip, but in doing so the weld opened up, as shown by Fig. 1; A and B, top and bottom parts; C, where welded; D, point at which welding

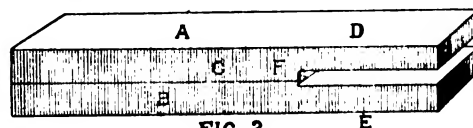


FIG. 2.

was stopped; E and F, parts turned in opposite directions to form the clip. He was in a dilemma. He held a consultation with a nearby smith and went at it again, welded as before, and as before started to turn off, the result being the same as before. He seemed perplexed. Again a consultation was held with his brother smith, but both seemed in a quandary. We concluded to offer our services and give both a practical lesson in smithing, and herewith give the

lesson for the benefit of others who may desire to know why the iron kept opening where it was welded.

If we wish to turn off iron at the end after welding it flat, we must prepare for doing so. The weld must end abruptly. If the ends to be turned off are lighter than the normal size of the iron, we prepare such ends as per Fig. 2; A, upper part; B, lower part;

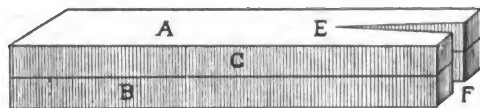


FIG. 3.

C, front of weld; D and E, parts to be turned off. We take the upper and lower parts, fuller in the ends in each, draw down, as shown by F, where the two are joined together. We take separate heats, place the two together at F and weld. We then taken one of the pieces D or E in the tongs, heat and weld the remainder. Next we heat to a good, red heat and clutch in the vise, so that the point F is just a line below the upper surface of the jaws of the vise, then with a hammer turn off just enough to permit of the insertion of a small fuller readily. We next heat F to welding heat, clutch in the vise as before and with a small hammer and



FIG. 4.

fuller make, as it were, a butt weld, shutting off all possibility of a free grain formation. It may be necessary, where the ends D and E must retain their normal size, to weld on a wedge and butt weld in a vise, as in the former instance. Another method is shown by Fig. 3; A, upper part; B, lower part; C, jointure of weld. Weld thoroughly the whole length, edging up as much as is necessary to get the size required, then split down through the two bars as welded, as shown on top at E and on end at F. By this method all possibility of opening up the weld is shut off.

The reader may wonder at our saying grain of iron. We will illustrate what we mean by Fig. 4; A, one end of a piece of iron,

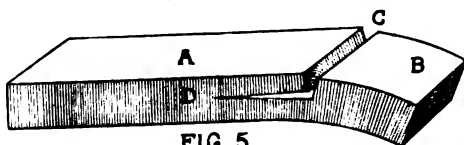


FIG. 5.

say 2 by $\frac{3}{4}$ in.; B, a much shorter end. With a cold chisel we cut in as at C, 1-16, $\frac{1}{8}$ or $\frac{1}{4}$ in., then we place the bar immediately under the cut, C, then hold a sledge on the upper side next to the cut, E, on the long end, and with a hammer come down on B, not too lustily, and you get results shown in Fig. 5; A, same as A, Fig. 4; B, same as B, Fig. 4; C, same as C, Fig. 4; while D shows how the iron may be pulled apart with the grain. With care, a bar may be disintegrated its whole length.

RESHARPENING OLD FILES.

APROPOS of a recently proposed electrolytic method of resharpening old files, referred to recently in these columns, we are reminded of the statement once made, that after all the best thing to do with an old file is to throw it away and buy a new one. This has been the conclusion arrived at by a great many whose experience has extended over the once much talked of sand-blast file sharpening process and the methods of etching and recutting, all of which have been practiced with more or less success. Sand blasting files has been claimed by some to be quite useless, as it makes the teeth shorter and simply raises an edge which has no durability. In recutting the temper must be drawn, and the quality of steel used for files—or at least some of them—has been stated to be such that it deteriorates rapidly when rehardened. Right here, however, the point may be made, as indeed it has been by the advocates of recutting, that it all depends upon what grade of file one buys in the beginning. True economy ought to commence by purchasing that file which will yield the largest return for the outlay, and with this grade of file recutting has been claimed to pay. The grade which will not stand recutting is the cheap, common kind, and buying this has been characterized as a waste of money at the outset. Whether with the best kind of file that money can procure etching, too, is an economical sharpening process, remains yet to be definitely decided.

—London Ironmongery.

Paint Department.

QUESTION.

M. J. R., Muncie, Ind., writes to learn, if possible, a good, quick method of painting a buggy to meet the demand for a job put out for from \$5 to \$6, this to include dressing of top and side curtains, storm apron, etc.

Replying to Mr. R.'s request, we may say that the competition which makes it necessary to actually *paint* a buggy for \$5 to \$6 is a bad one, carrying, as it so often does, a measure of misrepresentation that disturbs the public and painter alike, and in the end creates a financial loss, necessarily sustained by both alike.

Nevertheless, this \$5 and \$6 competition must be met, and it is best to meet it fairly. Any vehicle owner who wishes \$5 worth of work applied in the form of paint and varnish to his carriage should be given his money's worth in honest workmanship and stock, but under no circumstances should he be made to believe, or so informed, that he is getting a thorough job of painting.

To do a \$5 job of painting upon a buggy but little unhangings should be performed. Place the vehicle high enough from the floor, upon gear trestles, that the wheels may swing clear, remove wheels and if shafts uncouple easily take them off. Clean grease from axle arms, wheels and any parts of the surface touched with grease, give outside of body light rub over with pumice stone powder and water—clean up. If the top can be removed readily take it off; otherwise, leave it attached to the seat, in which case, at this point of the work, dust out interior, and apply coat of dressing to top. Coat joints, shifting rail, and, if necessary, bows, with color-and-varnish. Tack the side curtains up, along with other loose rubber or leather furnishings, and dress them. Whether the top is detached or left upon the job, it should early be gotten along to a finish. Black the bottom of the body and seat, and give the interior of the body a flowing coat of black color-and-varnish. Coat the outside of the body with a coat of drop black containing sufficient varnish to give it a trifle more than an egg shell gloss. This will serve as a substitute for a rubbing varnish coat without the expense of the rubbing coat, surfacing, etc. The same day this gloss coat is applied flow on the finishing varnish coat. Moisten a clean sponge and wash surface over just before varnishing. This will prevent crawling of the varnish. The finishing coat over such a gloss surface stands out in its full lustre and body, and gives a far better one coat finish than may be had over a dead or flat coat of color.

Touch bare places on running gear parts with lead. The morning following coat up with flat color, stripe on this, and late in the afternoon finish with a heavy gear varnish.

Such, in brief, are the swift, few details covering the \$5 or \$6 job, as we have become familiar with them.

HOW TO TAKE CARE OF BRUSHES.

POINTERS THAT THE DEALER CAN PASS ON TO THE PAINT USER.

BAD painting is often a matter of bad brushes—brushes that have not been taken care of properly. Twisted bristles and misshaped ends will make the best paint cover poorly, and always deface the surface with brush marks.

Most practical painters recognize this, and are careful to see that their tools are right and kept in good condition.

The bristles of every brush are held in place by the handle. It passes through the shank of the brush and is kiln dried to fit perfectly. If it shrinks, however, its outward tension is lost and the bristles loosened.

For this reason the first principle in brush care is to keep the tool, when it is new or not soaking, in a cool place, out of hot rooms and any temperature that would tend to shrink the wood of the handle. It is a point to be kept well in mind by the dealer as well as the consumer.

No new brush should be dipped in the paint and put to work without first being cleaned. By working it with brisk movement back and forth through the hand most of the dust and loose hairs will be taken out. A paint brush, when thus thoroughly "dry cleaned," should be placed in water for a few minutes, not long enough to soak or swell it, but only until wet through, and then

swung and shaken dry. It is then ready to dip in the paint, and although some of the hairs may still be loose, most of them will come out in the first few minutes working and can easily be picked from the surface.

For the first two or three days new brushes require special care while at rest. They should be dipped in raw oil or the paint itself



FIG. 1 illustrates an ice wagon belonging to the Empire City Hygeia Ice Co. The body is painted blue, the company's name orange, outlined on the left side with white, and shaded with two shades of vermillion. The ice scene is pale blue and white. The address is orange, shaded with vermillion; striping, yellow.

and smoothed out carefully; then laid on their sides over night. The chisel pointed brushes should be set at an incline, the handle supported just enough to allow the brush to lie along the point. This is done to prevent twisting of the bristles, and to keep the shape of the brush perfect. It is necessary to do this only two or three times before the shape becomes "set."

The second most important principle in brush care is *never* to leave the brush on end while at rest. At night it should always be placed in a "brush keeper"—a watertight box, or a paint keg, with nails driven through the sides on which the brushes can be suspended in water. Holes are bored in the handles so the brush will hang free of the bottom, but with the bristles entirely under water. Before placing them in water, the brushes should be wiped so as not to be too full of paint, *but not cleaned*. Even for temporary rest during a job the brush should never stand on end.

Varnish brushes and brushes used in varnish stain, buggy paint and all color-in-varnish require different handling than paint brushes. They should be more thoroughly "dry cleaned" for one thing, in order that all loose hairs may be worked out. After working them through the hand it is a good thing to pass the brush back and forth over a sheet of sandpaper. This rough surface will pull out the loose bristles and smooth down the rough ends of the chisel point.

The brush should then be washed by working it a few minutes in clean turpentine and swinging it dry. It should never be put in water.

For carriage work and fine varnishing the brush should be "broken in" on the rubbing coat, in order to work out all the dust particles before it is used on the finishing coats.

Varnish brushes should be kept at rest in turpentine and varnish, or better still, in some of the varnish that the brush is used in. They should not be kept in turpentine only, as that makes the brush "lousy"—roughens the bristles.

All brushes should be washed in benzine or turpentine and shaken dry—not whipped—when it is desired to change from one color to another, or from one varnish to another.

If these simple rules are followed brushes will be found to last longer and the painting will turn out much better than it would otherwise. As a general thing, the brushes are an index to the worth of the painter—the better the brush, the better the painter.

NOTES ON STAINS.

If it is desired to stain any wood yellow, first coat the timber with a hot concentrated solution of picric acid, and afterwards dry and polish. Great care must be exercised when using this stain, as picric acid is poisonous. To procure a gray tint, apply a solution of one part nitrate of silver to fifty parts of distilled water; then coat the wood with a solution of ferric acetate until the requisite shade is produced. This preparation must not be allowed to touch the hands. No matter what may be the stain required, always take care

to use only the very best ingredients, and then if the work is not a success the failure is with the workman, and not the tools, and the keynote of successful staining is to remember that the agent employed is to color the wood without spoiling or obliterating the natural transparent richness of the wood grain. However, to resume the stains, for those who wish to obtain a rich purple, boil one ounce of madder and half an ounce of fustic in two gallons of water, and when boiling brush over the wood with the solution till the requisite degree of intensity has been obtained, and then with a weak solution of nitric acid, afterwards finishing with the following mixture: Put nine ounces of dragon's blood and two ounces of soda, both well bruised, into six pints of spirits of wine. Let the mixture stand in a warm place, and shake frequently, and when using lay on with a soft brush, repeating the coats till a proper color has been obtained. Afterwards polish with linseed oil or finish with varnish. To obtain a good mahogany stain dissolve two ounces of dragon's blood in one quart of turpentine. To get a good and cheap walnut stain dissolve some dry burnt umber in vinegar, or mix one pound of dry Venetian red with one pint of asphalt and one quart of turpentine. A fine red-brown can be imparted to maple, or a good yellow-brown to oak and fir by the application of a solution composed of fifty parts of commercial alizarine in 1,000 parts of water, to which ammonia is gradually added till its presence can be perceived by the sense of smell. It must then be brushed over with a 1 per cent. solution of chloride of barium, when the maple will take a dark brown tint, and the oak and fir a brown hue of less intensity. If instead of the barium a 2 per cent. solution of sulphate of magnesia be employed, a dark violet-brown will be obtained on the maple, and a dark brown on

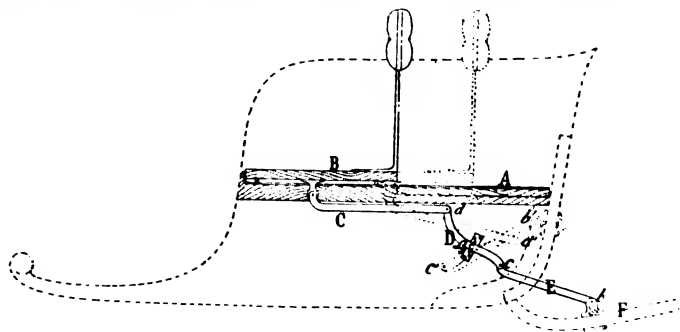


FIG. 2. Meat wagon. Main panel cream color, with violet stripe and scroll; "Mount Hope" vermillion, shaded two shades of green; "Market" blue, shaded with orange. Belt panel vermillion. Gold lilies, shaded black. Lower panel carmine; gold letters, shaded vermillion and black; fine striping, white.

the oak and fir. Alum and sulphate of magnesia will make the first-named timber a vivid red, and the other woods a blood-red. Chrome and alum give to maple and fir a reddish brown, and to oak a fine Havana brown.—*Decorators' Gazette*.

SHIFTING SEAT FOR A TWO WHEELED DOG CART.

THE illustration, Fig. 1, shows in outline a shifting seat device patented in France by M. A. Frezes. It is specially designed for a

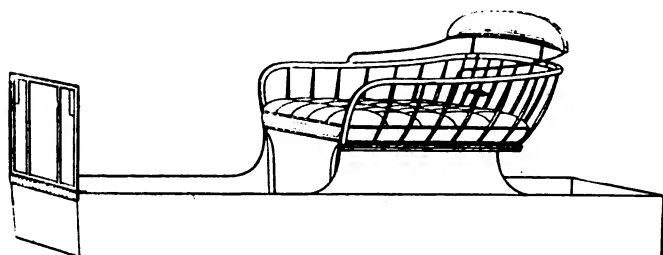


two wheeled dog cart. The seat A, at the rear, is fixed, while the frame B, front seat, can be moved forward or backward to accommodate two or four passengers. The system of leverages is simple and effective, the pivotal point being at *a* in the center of the S lever. A little study will make the operation clear.

Trimming Department.

TO TRIM A SEVENTEEN INCH SPEEDER.

Let us suppose, for example, that the job herewith illustrated is to be trimmed with green or blue broadcloth, the weight from 18 to 22 ounces. To make up the cushion, cut out the bottom in the usual way, giving $1\frac{1}{4}$ in. sweep to both the back and front, as the bottom will be drawn in nearly that amount in tufting. The bottom should be cut from enameled duck of a good weight, the front facing for the stiffener $1\frac{1}{8}$ in. wide, which will give $1\frac{5}{8}$ in. for the foundation. Cut the foundation out of drill or duck, the stiffener out of dash leather, and cover with the cloth. Get out the sides and back in practically the same way, only use collar or bow leather for a cover.



SEVENTEEN INCH SPEEDER.

Lay out the interlining in blocks, with four rows of buttons from side to side, as the job is very light, and the blocks should be small. Stretch the top out both ways, and leave $\frac{5}{8}$ in. fullness both ways.

The top must be plaited up on the machine, and be lined with wadding. For a very durable job the top should be lined with muslin and the wadding placed between the fabrics. Make up the fall with a plain $\frac{7}{8}$ in. riser, extending out flush to the edges.

To trim the lazy back, secure two thicknesses of wadding to the back by a couple of small tacks, being careful to drive them in far enough not to show after the collar leather is drawn on. Use no paste to secure the wadding, or any water on the collar leather, but draw it on tightly, especially in its length. The cane welt should be covered with collar leather, using very small reed; the flat welt can be either of cloth or collar leather, stitched at one edge and blind tacked on.

Cover the dash with hand buffed grain for both the back and front, with a sheet of wadding in each panel. To get a good edge for the top, cut a piece of harness leather $\frac{3}{4}$ in. wide and skive down moderately thin; then, with the round knife, skive one edge the entire length. Insert the skived edge down between the iron and the back of the dash. Hold in place while it is being stitched; this will give a good, firm and durable edge, that will be susceptible of a high polish.

REST BACK—FRONT SEAT OF CABRIOLET.

The accompanying illustration, Fig. 1, shows a new design for trimming the rest back for stick seat for cabriolet. Make the rough lining of two ply of buckram and one piece of muslin, the three pieces well pasted together and rubbed out with wet sponge and the slicker. The curved lines around the sketch mean that many rolls. The inside of the rolls is plain cloth, except the three tufted lines. Cut the cloth for the rolls in four pieces, and line

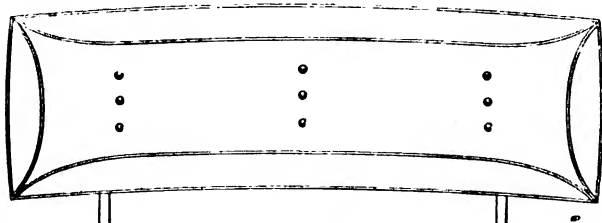


FIG. 1. FRONT SEAT OF CABRIOLET.

with muslin with cotton in between. Sew a cord welt to the inner edge of each roll, being careful to full the cloth to the cord welt at the curve lines, but between the points at the starting of the curve lines the cloth must be kept stitched along the cord welt. Lay the cloth off for the space between the rolls with $\frac{1}{4}$ in. fullness between each tuft line. Allow enough cloth between the end spaces to work them up full with the inner spaces. No fullness to be allowed lengthwise of the cloth, except enough to work the edges

up and to sew the cord welt to. Fold the cloth on the wrong side along tuft lines and stitch close to the edge of the fold; make no marks on the cloth for the tufts, for they are not put in until the back is all finished. Sew the cord welt on to the curve lines carefully. Cut the cord out $\frac{1}{2}$ in. from the end of the rolls, and extend the welts over the edge of the back.

Tack rough lining to the back, along and under the rolls, using care while driving the tacks not to kink the cord welt. Fill the rolls up and miter together neatly at the corner of each roll. The front edge of the back must have a cord welt, finished with a flat welt. Seaming and pasting laces are included in the terms "cord welts" and "flat welts." Cut off the eye of the tuft with cut nippers, punch a small hole through the tuft and put a $\frac{3}{4}$ in. No. 4 round head screw (silver or brass head) through the hole to see if the screw will work free without turning the tuft. When the nine tufts are fitted with screws, punch a small hole through the cloth and into the wood. Place the tuft over the hole and insert the screw, run the screw head through the worsted until the head of the screw rests firmly on the tin of the tuft; the worsted of the tuft will close around the head of the screw and hide it from view.

TRIMMING DESIGN FOR A BROUGHAM DOOR.

The accompanying illustration, Fig. 1, shows a pretty design for trimming a brougham door. The material used is to be goat skin and lace. Make the rough lining with one ply of buckram and a piece of canvas, well pasted and rubbed together. Cut the rough lining in two pieces. The part for the diamonds to be 6 in. wide. The goat skin for the diamond squab must have $\frac{3}{8}$ in. fullness

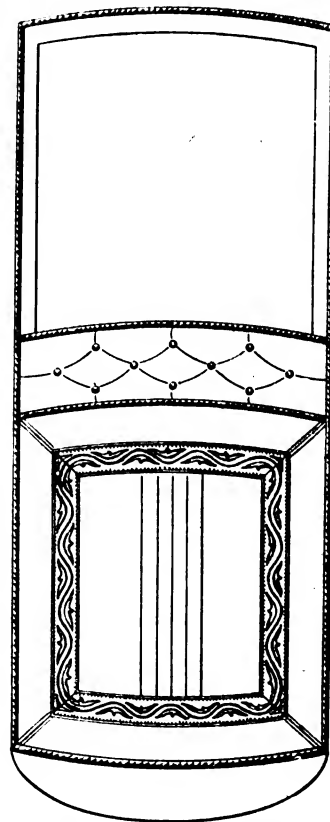


FIG. 1. BROUGHAM DOOR.

between the tufts each way. Crease the goods along the tuft lines and stitch near the edge on the machine. The squab must be stuffed up full, but very softly, and both of the edges finished with seaming and pasting laces.

Miter the border around the door at each corner so as to form a slight roll. Stitch the miters, press out and crease with a fine line on each side of the seam. The inside squab piece has five crease lines drawn through the center; make these lines with a warm creasing tool, using a little tallow on the surface of the leather. Finish the out edge of the door with seaming and pasting lace. The illustration shows plainly the small points of the work, so that it is not necessary for further remarks.

Make the inside front, Fig. 2, on a stiff foundation, and in the same manner as the door, except the broad lace at the top, which

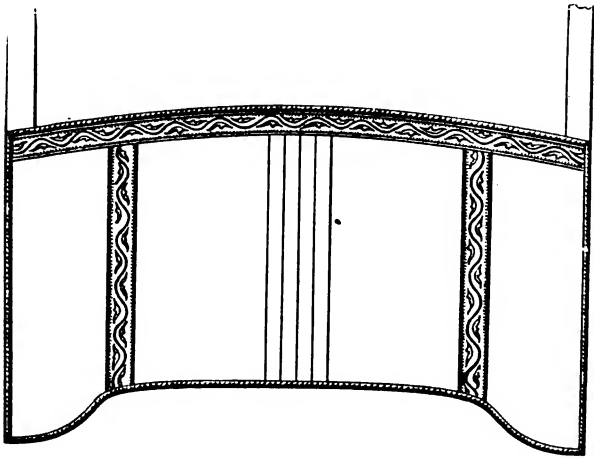


FIG. 2. INSIDE FRONT.

is made to lay flat without either wadding or hair underneath it. Finish the edges with seaming and pasting lace.

BACK FOR RUNABOUT.

THE illustration, Fig. 1 shows a very neat and suitable design for backs for no top work, which is inexpensive and very simple to make up. No rough lining is required to work it on. The design is drawn off on the wood. The two lines of tufts through the center of the back are $3\frac{1}{2}$ in. apart; the cross lines are 4 in. apart. These lines and tufts represent a row of block work. Small holes are to be made in the wood for the points of the tuft nails, also at the end of the lines, at the top and bottom edge of the back. The cloth is laid off with $\frac{3}{4}$ in. fullness between the tufts across the block, and $\frac{5}{8}$ in.

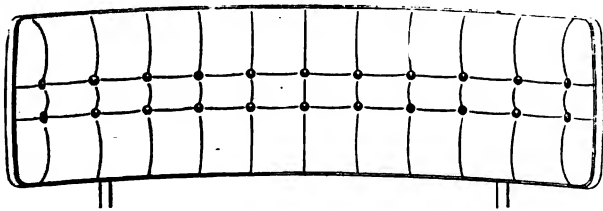


FIG. 1. BACK FOR RUNABOUT.

fullness in the length of the block. Crease the cloth along the tuft lines with a hot iron. The $\frac{3}{4}$ in. fullness crosswise the block is all (not a part) plaited out under the tuft. Tack the top and bottom edges of the cloth at each tuft line on the top of the edge of the wood with pointed tacks. Place the hair in from the ends with the hand. Drive in the covered tuft nails carefully and work up the rolls neatly. Plait over the edge of the back. Tack a cord welt on the front edge of the back, and finish off with a neat flat welt. If the fullness is all plaited out crosswise of the blocks, when the back is finished there will be a perfect plaited roll through the center of the back.

WEDDED.

JAMES W. HUME, a member of the firm of the Hume Carriage Co., Amesbury, Mass., and whose father was its founder in 1857, was married at the home of the bride's parents to Miss Gertrude M. Janvin, Tuesday evening, June 12. The house was beautifully decorated with ferns and flowers. They received many beautiful and costly presents, among them being a silver service from the employees of the Hume Carriage Co., and another from the Quis-anna Club, of which Mr. Hume is a member, a very elaborate cut glass punch bowl and glasses, and a large variety of solid silver ware. They left on an evening train for Boston and from there will go to New York City. Their at home cards announce that they will be at their new home, 125 Elm street, after August 1. Their new home is elegantly furnished by the groom's parents. THE HUB congratulates the happy couple.

SPEEDING WAGONS.

IN no line of carriages has there been so marked a change as in the light speeding wagons. The gentleman's one man wagon, while recognized as the standard for road driving, is not, strictly speaking, a speeding wagon, although many of the owners of fleet trotters prefer it to any other, as it is comfortable as well as light, and is far more attractive in appearance than any of the newer styles.

The introduction of the bike, or wire wheel, created a necessity for an entirely new gear, as the wheels were lower than those of the standard road wagon, being 36 and 38 inches, as against 45 and 48 inches, a difference of 9 and 10 inches. This necessitated the banging of the body very low, or arching the axle to raise it to the required height, and the problem was not easy to solve. Stability was an actual necessity, and weight had to be kept to the lowest point possible. The minimum was finally reached by the double tubular arched axle, bolting the body to the rear axles, and a straight bolster in front to which the upper section of the fifth wheel is secured, while the lower section is secured to the axle, thus doing away with springs, reach and braces. By this means the weight has been brought down to about eighty pounds; but the vehicle is not a pleasure carriage, as the absence of springs makes riding in it uncomfortable, except upon well graded earth roads. The use of pneumatic tires contributes to relieve it a little, but no man would use one were it not that it has no superior for speeding. The absence of springs and the direct connection with the axles, combined with the rubber tire, however, makes it an ideal speeding wagon. This and the standard one man road wagon represent the extremes. Between these there are numerous others that are compromises, in which comfort is not sacrificed by the elimination of springs, or stability by the too free use of them.

The recent speedway parade in New York brought together a large number of these light road vehicles, just how many different styles we are unable to state; but there were not less than a dozen different gears, and nearly if not quite that number of bodies that were unlike the standard square box. A number of these styles and combinations are shown by our Fashion Plates this month, and others by our plates of horses in harness before the wagons.

One noticeable feature is the change in the panels of the bodies, the tendency being to make them from one to two and one-half inches lower than the standard. In some the front is cut down to one-half the depth of the main panel; in others the ends are slightly lower than the center. The seat riser panel has been shortened and concaved more or less, and in some cases the panel has been removed and the supports rounded or otherwise finished. The seats have bent or turned spindles, or the standard low panel. Where extra lightness was not made a condition the lazy backs were deep, but otherwise a three or four inch back, supported by iron standards, was used. Tops were entirely dispensed with, except on the standard wagon. Dashes varied in height; there seems to be no governing rule regarding them. They were, however, square, four bar, with hand holes cut into the leather.

A noticeable feature in construction of the speeding wagons, other than those with bike gears, is the hold that the runabout and naked gears have obtained. The percentage of gears in which the "runabout" principle was applied was fully 75 per cent. of the total, while the naked gears were so nearly universal that no opportunity was afforded to judge as to the number of the old style clip gear. These gears were used alike with side bar and cross springs and elliptics, and the question of their having come to stay is fully settled, and their use is likely to increase until something better can be brought out.

Looking over the great array of speeding and road wagons, we found that the wood wheel was a close competitor with the wire wheel even on bike gears, the height being the same as that of the wire wheels, and fitted up with pneumatic tires. These wheels appear somewhat heavy, owing to the bulky tire, but as we become accustomed to them this objection grows less, and we accept it in consideration of the fact that what we lose in appearance is more than made good by the increase in comfort. One point not to be overlooked in connection with these light wood wheels is the universal use of the wood hub. The heavy iron banded hub of the Sarven or Warner types is entirely ignored. These light wagons call for special care in construction and the use of the best materials. Their strength is phenomenal. It is no uncommon occurrence to see a man weighing 180 pounds or more seated in one of these wagons and speeding his horse at a less than three minute gait, and doing this day after day, with no more effect upon the wagon than the load of three or four persons has on a brougham.

MANUFACTURE AND SALE OF CARRIAGES IN THE PHILIPPINES.

WHEN the Spanish had control in the Philippine Islands it seems to have been their desire to keep all things modern out of the grasp of the natives. For hundreds of years the only types of vehicles used by the native element consisted of crude bull carts, drawn by the caribou, and a form of bamboo sled. These sleds are in use even now, for the time has not yet come for the change from these crude devices to up-to-date vehicles in these islands, except in the leading seaport cities and towns, in which places the Americans have lately introduced some of the best and most modern designs of carriages and wagons. For about 200 years the Spanish maintained such bad roads in the islands that wagons or any wheeled vehicle could not be drawn, even by the slow, steady and powerful caribou. The roads in the wet season were mere swamps, while in the dry season the depressions and elevations, the rocks and the general bad conditions of the roadbed made it almost impossible to use wheels of any kind, and the drag sled was the only means of taking freight. But the war proved a great blessing to the country, so far as the roads and the traffic of people and freightage is concerned. Before the late war with America there was no one to look after the roads, except in the immediate vicinity of the cities and towns, where regularly hired labor was employed yearly. The country roads were neglected entirely, and most of them were impassable. But as soon as the Americans came here, about a year ago, and as fast as they captured insurgent prisoners, instead of putting the prisoners out of service by shooting them, they put them to work on the roads, until some thousands of native soldier prisoners were working at different points, breaking stone for road ballast, levelling off the bad places and clearing away the rubbish which had blocked streets and highways for many years. Some thousands of these prisoners are at work now, and at the rate the American troops are taking in guerilla bands in the mountain districts the supply of good road labor for this purpose bids fair to keep up for another year or more. Therefore, the roads of the Philippines to-day are in fairly good shape for vehicle traffic, except at the rivers.

Probably one of the main things that is keeping down the general use of vehicles throughout the country districts of the Philippines is the lack of proper means to cross the rivers and streams. In the dry season these may be crossed readily by fording, for the bottoms of the rivers are usually hard and sandy, and the wheels do not sink very far, and often wagon trains can be run across with a wetting of the wheels only as deep as the hubs. But in the wet season, which lasts from November to June, the rivers are too deep for fording, and bridges are then needed. But the Philippine bridges, like everything bearing the Spanish stamp, are in ruins, as a rule. The foundations are of stone and are good, but the upper work is usually in such shape that horses or wagons cannot cross. The Spanish neglected the bridges, and the natives would not do any repair work, for that would help the Spanish, and therefore the bridges were permitted to go to ruins.

Not many months ago wagons could not go very great distances out of the cities, due to this one thing. But the Americans have also gotten to work at the bridges, so as to get their supply trains of commissary and substance stores to troops in the interior, and they have employed native and other carpenter labor to put the bridges in temporary order.

The opening of the roads and the repairs on the bridges in the islands have created considerable demand for wheeled vehicles of all descriptions. The old drag sled has seen its day, and so has the caribou, except for heavy freightage, and the ordinary types of modern vehicles are wanted here just as much as in any country. When the troops arrived here last year there were a few broken down two wheeled second-hand cabs, brought from Spain, and at the time the writer arrived there were about twenty-five such cabs in use in Iloilo, and probably a dozen more were owned by the presidents of the different cities, towns and barrios of the island. In Luzon they had quite a large number in Manila, and there were reported to be a slight sprinkling of the broken down and patched cabs in the cities of Negros on the Isle de Negros and Cebu on the Isle of Cebu. The presidents and the rich natives controlled these few vehicles, and the millions of ordinary people rode on drag sleds, crude bull carts, or walked. But since the first of the year enterprising parties in Spain and other European countries have been sending a form of two-wheeled cab here of modern style, which is sold at a very high price the moment the same is landed on the wharf at Iloilo, Cebu or

Negros. The parties shipping these cabs here are certainly making money. They will soon make more money, as the American military officials have just issued a new regulation, which requires that all of the old descriptions of vehicles be destroyed and new ones substituted, for the reason that it was stated by the surgeons that the cushions and trimmings in the old cabs, which had been in use for years in some other countries before being sent here, were infested with the germs of disease. This new order has increased the desire to buy every new form of carriage that arrives here, and as stated above, every description of wheeled vehicle is bought at the seller's price as soon as it is run off the ship or steamer to the wharf.

In Manila they have one or two agencies for the handling of wheeled vehicles and supplies, and they do considerable profitable business. There are no agencies for carriages or wagons in Iloilo, Cebu or Negros, although there are some millions of people represented in each place, some of whom have stores of gold at their disposal and are waiting the chance to buy. In Iloilo are one or two places where carriages are repaired, another place where harnesses are sold, and to these two places everyone goes to try to buy carriages or fixings for carriages, to make repairs, etc. These two places are in operation night and day, and the proprietors are employing all the skilled white labor they can get, and have a dozen or more each of the native class working at general repair and construction work. But what is wanted is a regular selling agency that can carry several designs of modern vehicles in their show rooms. The natives are great imitators of the Americans, and many of them are buying or trying to buy the two-wheeled types of vehicles, because they suppose no other kinds are in use. In the island of Panay alone there are about 5,000 very rich natives, whose fathers have made money before them in the running of large sugar plantations, sugar grinding mills, tuber plants, dye wood yards, tobacco and rice lands, and have made fortunes. These people have had their money idle and buried in the earth beneath their homes during the troublous times for safety. But now that the war is practically a thing of the past, they feel that it is safe to bring forth their wealth and use it as desired. They greatly desire nice, modern American carriages, and they have an abundance of money with which to buy. If these people are shown exhibits of fine carriages and wagons they will select the best, regardless of price. In this way a large sales business would be done. Then the native planters want heavy wagons for farming purposes, to use instead of the crude, two-wheeled article made by the native carpenter and wheelwright. These native carts are too clumsy for the native ponies, and are drawn only by the bulls or caribou. The wheel hubs are always untrue, and there are no boxes for the bearings, so that the wheels always incline to the right or left and bind against some part of the cart, causing unnecessary friction, like a brake, the extra pull of which comes upon the animal in the front. Another form of light carriage should be carried for the middle classes of people, of which there are some millions. These include the ordinary workers and farmers, some of whom have money in moderate amounts and in sufficient quantities to purchase some of the luxuries of life.

When your correspondent arrived here in the summer of 1898, half the male population seemed to run about the streets in breech cloths. When the Americans began to appear in their white duck suits the natives began to do the same. This idea was forced along in a way by the guards of the troops in the cities and towns stopping all men and boys in breech cloths only and sending them home to put on pants. In a very few months all of the men and boys came out in white suits of duck for dress and colored for work. With this change for the better came the desire for shoes and hats like the Americans', and as there appears to be no stop to a thing of this kind when once started, the indications are that the crude native of old will soon be no more, and his place will be taken by the modern Americanized native, who wears shoes, hats and clothes, wants carriages and bicycles, craves for the typewriter and the telegraph, and, as results have shown, even wants Kodaks. There have been immense demands for all the latter articles mentioned, and the demand increases daily. Discharged soldiers are ordering great stocks of goods from America, and will make money selling them to the new type of Filipino. With all these ideas in the heads of the natives, the method of travel by the Americans in America is not overlooked. The natives have seen samples of good carriages in limited use and they want the same. They have seen officers and officers' wives riding in open carriages with coachmen, and many of the rich natives, who have untold wealth, want to imitate this plan. I have occupied the porches of rich native houses with the family when Americans and others have driven by in true American

fashion and noticed the remarks of the head of the family. After once seeing an outfit go by, his mind runs on it the rest of the evening, and he wants to know how he can buy the same, what to do to go about it, how long will it take to get the outfit here from America, who in America shall he cable to for the rig, etc. He does not consider the price. Why should he, with plenty of money made by himself on large plantations, or by his forefathers?

It has been said that the seasons of the Philippines are in two divisions, one of which is mud and the other dust. But this is an exaggeration, for during the stay of the writer here there has been one stretch of season, from December to April 1, when the roads were in excellent shape, little dust flying, although there was no rain at all during that period. The earth on the roads seemed to bake hard, and although the heat and dryness causes cracks to appear in the unused portions of the roadbed at the sides, the middle of the roads seemed to be in good shape, and so hard and firm that very little dust arose. At the same time, it must be borne in mind that there are certain sections of the islands in which there is a fine dust developed during the dry season, and this dust seems to rise readily when disturbed, and some of it is liable to work into the bearings of the wheels at the hubs, causing heating, grinding, etc., due to the absorption of the lubricant and the friction. Therefore dust proof bearings of exceptional good qualities should be employed. Another feature is that very little ornamental work should be used, except such as will not rust readily. To offset the dust period in these islands is one of wet and dampness of several months, during which the mucilage on postage stamps softens and causes the stamps to stick together, while anything bright and polished on wheeled vehicles is likely to tarnish unless specially prepared to prevent it. The springs in the carriages for these islands ought to be particularly elastic, and specially strong to withstand the constant jar of the numerous stones which exist in all of the roads. The day may come when the country roads will be cleared of these small stones, but at present they are very numerous. Plenty of headlights should be provided for the vehicles, for this is part of the pleasure of the native family—riding at night. They like to have from two to four red and yellow lights around their carriage, two in front on the dasher and two in the rear. It must be remembered that when the sun is high in the heavens here the thermometer stands at about 120° in the sun and 95° Fahr. in the shade from 10 o'clock in the morning until 4 o'clock in the afternoon. Therefore a great deal of the riding is done in the evening and night, for the wealthy sleep during this hot period of the day, so as to be awake only when it is cool. Most of the riding by the rich is at night, and it is then that they want a goodly showing of brilliant reflecting colored lights on their vehicles to indicate that they are somebody of note and richness.

If the fact that as soon as an American or native opens a carriage repair shop he is driven night and day with work and with inducements to secure new carriages or make carriages is any indication of the need of carriage shops in these islands, then it is safe to assume that the time has arrived for the introduction of such establishments. One need not want for money in order to put an enterprise of this type on its feet, for there are a great many wealthy natives here in Iloilo, Molo, Jaro and adjoining cities and towns, who are constantly asking the American naval and military officers for advice concerning the investment of amounts of money ranging from \$5,000 to \$10,000 in American enterprises, such as carriage works, textile mills, sugar plants on modern plans, wood-working factories, flour mills, etc. They have great faith in American success with these affairs, and only want a surety of the faithfulness of the parties engaged in the scheme and they are satisfied to place funds in it, in the way of buying stock or investing capital direct. An honestly disposed carriage manufacturer could establish branch factories in these islands and make a great deal of money.

The entire equipment of the factory would of course have to be shipped here, as no machinery of any kind can be bought except some little boilers and engines sent here for use in sugar mill work. The entire plant should be provided with its outfit of machinery and power system in the United States and shipped here. After arriving here, American machinists would be needed to set up the machinery, but there are plenty of these men here now, and it would not be necessary to go to the expense of bringing machinists here from America. There are always a few vacant stone or bamboo buildings in all of the important seacoast cities suitable for putting in machinery of a carriage works, and one of these could be bought or rented.

After getting the machinery in place, the manufacturer would

find that it would pay him to hire a lot of intelligent young natives and train them to operate the different machines. Since the first of the year a number of these young natives have been taught to compose type in printing plants, run typewriters, telegraph in signal stations, run engines and steam plant of ice machine works, etc., and the same could be done with some of the natives in running the machinery in carriage works. These young natives can be hired for 25 cents per day in American money and they support themselves. The trained American mechanics charge \$4 and \$5 per day for labor, and these men could be hired, at the rate of one for each department, to supervise and instruct the natives in their work.

CINCINNATI LETTER.

JUNE 14, 1900.

SATURDAY afternoon, June 9, was set apart by the Carriage Makers' Club, of Cincinnati, for its annual outing. Neat cards of invitation and admission to the boat had been issued, and promptly at noon the steamer *Levi J. Workum* left the wharf at the foot of Main street for a three hours' run down the Ohio River. A substantial luncheon was served en route. The meeting of old friends, and the opportunity to entertain a number of invited guests, the beautiful scenery of the densely wooded hills on both sides, broken by occasional valleys, the delightful day and fresh air, the music of a good brass band and the minstrel performance by a colored troupe were some of the features which occupied attention on the way to the beautiful grove opposite Lawrenceburg, Ky. On the arrival at this place, some of the party took a ferry, worked by horse power, over to Lawrenceburg's base ball grounds and ten pin alleys. The majority remained on board for further entertainment from the colored minstrels, or amused themselves in other ways until, tiring of this, they strolled ashore, through the leafy woods. A stone path led to a convenient shelter house overhanging the high bank and commanding a fine view of the river, with its passing steamers, and the town of Lawrenceburg on the further side. Still further on, the path led to another but larger pavilion, then to long rows of tables under tall forest trees, where, at about 6 P. M., an elegant repast was served. Not far away were convenient places for amusement to suit all.

The return trip began about 7 P. M. A friendly exhibition of sparring with gloves, by professional boxers, music and a vaudeville troupe performance, added zest to the entertainment. The boat reached Cincinnati at about 11 P. M.

Altogether the occasion was very enjoyable, and well conducted. The entertainment committee deserve great credit. This consisted of E. V. Overman, L. K. Emerson, Louis Buob, W. H. Bowe and John W. Herron, Jr., and the officers of the club: President, H. M. Pollock; first vice-president, John McGrath; second vice-president, L. G. Mayer; treasurer, W. H. McCurdy; secretary, S. D. Baldwin. The members present were:

L. A. Harker.
William C. Laidlaw.
Julius Lang, Jr.
John W. Lee.
H. R. Liebman.
A. Lounsbury.
Theodore Luth.
W. H. McCurdy.
L. G. Mayer.
Lee Mitchell.
Albert Morsbach.
F. S. Nelson.
Joseph H. Niehaus.
E. V. Overman.
Charles Pfeiffer.
John P. Pollock.
H. M. Pollock.
C. F. Piatt.
H. Ratterman.
C. L. Reifsnider.
H. J. Robben.
W. G. Rossiter.
William A. Sayers.
Theodore Scheu.
A. Schneider.
E. F. Shultz.
George Smith.
Joseph Snow.
C. F. Stephens.
W. S. Sterritt.

Albert Armstrong.
S. D. Baldwin.
J. J. Barry.
C. Bauer.
E. S. Bogle.
W. H. Bowe.
Edward Bowman.
George H. Brown.
Robert S. Brown.
George S. Brown.
W. G. Brown.
W. F. Benenger.
A. G. Brinsman.
William Bryan.
Louis Buob, Jr.
E. S. Busch.
M. C. Center.
M. A. Doucette.
B. F. Fallon.
A. Fenser.
M. L. Green.
Jacob Haberer.
W. J. Haldeman.
William F. Harvey.
George W. Hatley.
William A. Havens.
W. L. Hawes.
E. J. Hess.
Henry Higgins.
George Hunterman.

F. A. Stickney.	H. K. James.
J. F. Taylor.	Max Jewett.
D. P. Thorpe.	W. J. Kauffman.
O. A. Timberlake.	Ira D. Washburn.
O. E. Walker.	C. C. Wicks.
Joseph Wallenstein.	George H. Williamson.
W. W. Warner.	William B. Wise.
Charles H. Albrecht.	H. Zwick.
Carl F. Albrecht.	R. F. Walbank.
E. D. Albro.	Fred Guethlein.
Otto Armleder.	Joseph Shelt.

George W. Conrad.

In addition, there were about 150 guests, mainly personal and business friends of the members, engaged in different pursuits.

One of the features of the dinner was an eloquent, but pithy speech by Congressman J. J. Bromwell, who guaranteed to see that the weather clerk would put away on ice just such another beautiful day for the special use of the carriage makers whenever they wanted to take another outing, if they would let him know about two weeks beforehand. Mr. Bromwell's remarks were full of patriotic and humorous allusions, and created much enthusiasm.

The general conditions of trade in carriage lines in Cincinnati are very satisfactory. Business has not been on a rush, but very steady, and prices have been well sustained. The old stocks, bought before the rise, have been about worked off, and a fresh demand for material has sprung up, so that the carriage goods men are now busier than they were six weeks ago.

Among the new houses in this line is that of Bryan & Taylor, who occupy a conveniently located store on Main street, near Seventh. Mr. Bryan was formerly with the Sligo Iron Store Co., of St. Louis, and Mr. Taylor with the National Hardware Co., of this city. They handle, among other goods, Bridgeport coach laces, Hardt, Von Bernuth & Co.'s cloths, Schofield, Mason & Co.'s carpets, T. P. Howell & Co.'s leather and the Cherry Heat Welding Compound.

M. C. Center & Co., located on Findlay street, are another new concern in carriage goods. Mr. Center was formerly with the Dash & Carriage Goods Co., and Mr. Jesse Wozencraft, the Co., was with the Emerson & Fisher Co. They handle Weldon & Taylor's fringe, the Cortland Specialty Co.'s goods, the Keratol Co.'s line, Landers Bros.' cloths, Penn Rubber Co.'s drills, F. C. Rogers' carpets, and the lines of goods made by the Keystone Forging Co. and F. W. Thurston & Co.

The wholesale shops of the city are proceeding on their usual methods, there being no new developments to speak of except the removal of the Advance Carriage Co. from Sycamore and Court streets to their new factory at Third and Eggleston avenue to Lock. With three fronts, they have a well lighted shop. The Eggleston avenue tracks, with a special switch track of their own, give them fine shipping facilities. The old canal race, running deep below the surface of this street, but along that side of their building, furnishes splendid water power, although the factory is equipped with a fine engine and boiler, to use when needed. I noticed a new method of crating buggies, which included wheels and extended top, and yet permitted of getting thirty-six crates in a 45 foot car. The crate was cube shaped, with a quarter of the cube cut out, allowing the crates to nest together.

This factory has been equipped in the most modern manner, and its arrangement is most admirable for convenience and the utilization of every part of the floor space. They are producing about fifty vehicles a day, mostly surreys and phaetons, the designs of which certainly looked attractive. Mr. W. H. Bowe is the master mind of the shop.

It is likely that the next year will witness a great many new styles of vehicles produced in this market. The advertised offer of Sechler & Co., of \$300 for the most acceptable designs of buggies, phaetons and surreys for their use, brought a great many responses from all parts of the country. Almost all of them were meritorious. Some were too ultra in style or novelty, some too expensive in construction to be considered, and some better adapted to some local market. Sechler & Co. selected three designs by F. C. Manns, engraver, and three designs by D. W. Miller, a well-known carriage builder, both of this city. Each submitted about forty-five new designs.

The example of Sechler & Co. has stimulated other manufacturers of this city and elsewhere, particularly in Michigan, who do not propose to be outdone, and who are now looking for practical and salable novelties which will represent advanced ideas.

The Emerson & Fisher Co. have been building automobiles, and

have been successful in producing a vehicle which runs satisfactorily. What the future of the automobile may be in Cincinnati is not yet apparent, but, owing to our hills, there does not appear to be much favorable feeling created by those half dozen of different makes which are now running in this city.

In retail lines there has been some improvement over last year's trade, but not enough to make it satisfactory. The demand is mostly for runabouts, of which there is a great variety on the market, and there is almost an entire absence of the strictly fine hand made specimens of workmanship. The number of people who know and appreciate the difference between really fine work and wholesale factory work is woefully small, and there is not enough of it left to keep even a small shop running.

The extensive street car system of this city has made getting about so convenient and cheap that it has almost killed the cab business, and most of our wealthy citizens have even sold their carriages, and to-day their wives and daughters can be seen, in their fine dresses, sitting down in a crowded car. How long this condition will last is problematical, but there must come a revulsion, and the economical spasm which has seized on wealthy classes will eventually pass away, and madam will once more ride in dignity, comfort and cleanliness, in her own carriage. In the meantime, the "first class" carriage maker has to deal in second and third class goods to keep alive; but the greatest part of his business is repairing.

The Carriage Makers' Club has decided that its members shall not exhibit at the dealers' convention, to be held in November. The manufacturers feel that such an exhibition is not to their advantage, but they will exert themselves to have a handsome show of vehicles in their several repositories, and to entertain those dealers who visit them.

The exhibition will no doubt be a success, as it is evident from the applications so far reported that outside manufacturers will take advantage of the opportunity and exhibit as largely as the floor space will warrant.

The retail carriage trade could hardly be any more demoralized than it is already. Every wholesale factory in town sells to consumers whenever they get a chance, at any price, apparently. There is absolutely no protection in this city, and a retail dealer could not possibly live in this market. Therefore, the exhibition can do little further damage in that direction, even if the general public is to be permitted entrance, which, we are informed, is to be the case.

EVOLUTION OF THE TRAP.

(Continued from page 511, March HUB.)

A PATENT was granted to Christopher C. Bradley and Thomas Faulder, of Syracuse, N. Y., for a shifting seat for vehicles, dated May 15, 1894. No. 519,832, illustrated by Figs. 209 and 210. This invention relates to that class of vehicles which are provided with shifting seats, and has the object to provide a vehicle which has a front seat and two shifting rear seats, so that by adjusting the seats the vehicle can be used as a one-seated vehicle, a two-seated vehicle with both seats facing

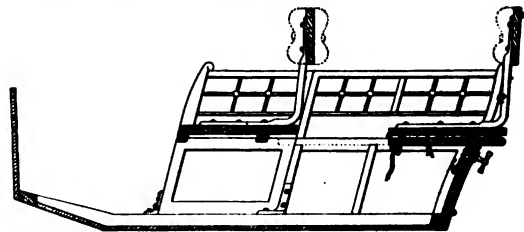


FIG. 209.

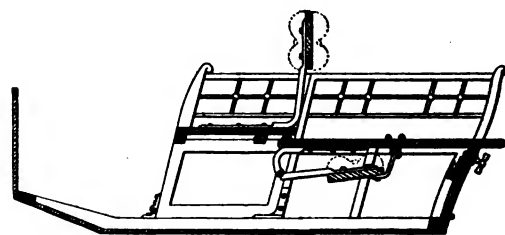


FIG. 210.

forwardly, or a two-seated vehicle with the seats arranged dos-a-dos, the construction and arrangement of the rear seats being such that they can be folded down, when not required for use, one behind the other, to form a deck in rear of the front seat.

CHARLES N. DENNETT, of Amesbury, Mass., was granted a patent for a carriage, dated July 17, 1894, No. 522,976, illustrated by Figs. 211. This invention relates to that class of carriages which are pro-

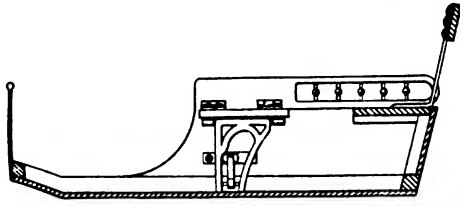


FIG. 211.

vided with divided seats—usually front seats—i. e., seats which are divided longitudinally with the carriage body into two seats; and particularly to those divided seats which are adapted to be swung up sidewise or toward the side of the carriage body, to provide room for passage.

C. N. DENNETT, of Amesbury, Mass., was granted a second patent for a carriage, dated July 17, 1894, No. 522,976, illustrated by Figs. 212 and 213. This invention relates to that class of carriages in

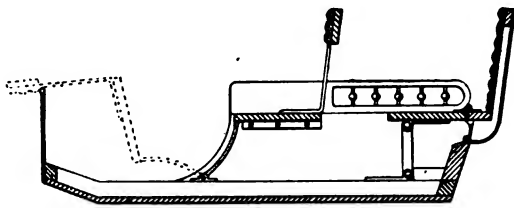


FIG. 212.

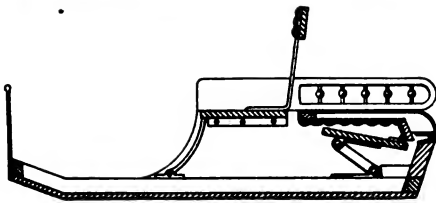


FIG. 213.

which a seat and seat back are so arranged that when the seat is not in use it is lowered into the carriage body by moving the seat back or lazy back from its normal vertical position down into a horizontal position, in which it serves as a deck or deck panel.

FRANCIS N. VANIER, of Amesbury, Mass., was granted a patent, dated October 23, 1894, No. 527,909, illustrated by Figs. 214 and 215. The object of this invention is to provide a carriage having two seats,

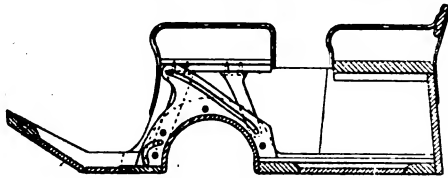


FIG. 214.

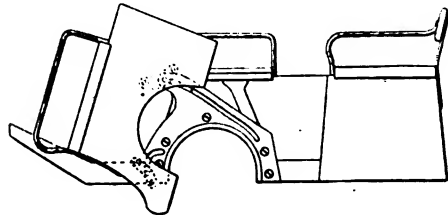


FIG. 215.

the front one of which is mounted in grooves to be turned forward so as to allow room between it and the rear seat, so that the occupants of said rear seat can pass between the two seats in entering and leaving the carriage.

OUR PHENOMENAL EXPORTS.

AN exportation of \$40,000,000 worth of manufactures in thirty days is a record unparalleled for American manufacturers. That is the record for the month of April, 1900. The details of the April exportations, just completed by the Treasury Bureau of Statistics, show that the exportation of manufactures during that month was by far the greatest for any month in our history, and within a fraction of \$40,000,000. This gives assurance that the exports of the

fiscal year, which ends with June, will considerably exceed \$400,000,000, and be nearly three times as much as a decade ago. This phenomenal increase in exportation of manufactures is especially striking when compared with the progress made by European nations, our rivals in the attempt to supply the world's market with manufactured goods. Great Britain's exports of manufactures show but slight increase since 1890, and an examination of the export record of the principal European countries fails to disclose an instance in which the increase has been as much as 25 per cent., while that of the United States, meanwhile, has been more than 150 per cent.

An examination of the details of our own exportation of manufactures shows that it is in the production, manufacture and exportation of metals that we seem to excel. The history of nations and peoples shows that great groups of people frequently excel in certain industries, and the growth of our exportation, as well as our domestic production of manufactures, seems to point to metals as our most successful line of work, especially at the present time. In 1889 manufactures of metals formed less than 20 per cent. of our total exportation of manufactures, and in 1900 will be about 45 per cent. of our exports of manufactures. The increase in exportation of metals and manufactures thereof in the decade 1889-1898 was 339 per cent., while the increase in the exportation of all manufactures in that time was but 110 per cent., and the increase in manufactures other than those of metal during that time was but 55 per cent. In this statement of the exportation of manufactures of metals, only those articles composed exclusively of metals are included; those made up in part of metals, such as railway cars, agricultural machinery, etc., being included in the other manufactures. The rapid increase in the exportation of manufactures of metals is shown by the fact that the exports of brass and manufactures thereof in 1889 were but \$321,137, and in 1900 will reach \$1,700,000; instruments for scientific purposes increased from \$1,033,338 to \$2,270,803, and in the year about to end will reach nearly \$6,000,000; copper and its manufactures, which amounted in 1889 to \$2,348,954, will be more than \$50,000,000 in 1900; iron and steel increased from \$21,156,077 in 1889 to \$70,406,885 in 1898, while in the fiscal year 1900 they will exceed \$100,000,000.

Another interesting fact developed by the examination of the figures is that the European countries in which manufactures have been long established, furnish as satisfactory a market for our manufactured goods as do the countries where manufacturing has not yet been largely developed. In reapers and mowers, clocks and watches, sewing machines, bicycles, and the various manufactures of iron and steel, and many other articles of the higher grades of manufacture, the European countries in which manufacturing plants and machinery and skilled workmen abound furnish a market for a large share of our exports, thus failing to justify the expressed fear that a development of manufactures in countries where we are now seeking a foothold for our commerce would destroy their value as a permanent market.

As already indicated, the largest growth in our export of manufactures is in that of metals. The largest class of manufactures of metals exported is that of iron and steel. In 1880 the export of manufactures of iron and steel was \$14,716,524, and in 1900 will exceed \$100,000,000, or more than seven times that of 1880.

In no feature of our export trade has there been a more remarkable growth during the decade than in rails for railways, especially those of steel. The total exportation of iron rails in 1889 was but seven tons, and in 1898, 2,769 tons, the value rising from \$240 in 1889 to \$37,150 in 1898. In steel rails, however, the growth was even more remarkable, the number of tons exported in 1889 being 7,398, and in 1898 229,782, while the value increased from \$235,387 in 1889 to \$4,613,376 in 1898 and in the fiscal year 1900 is likely to reach \$8,000,000. This increase has been especially marked during the past three years, the exports of steel rails in the fiscal year 1896 being \$540,797, those of 1897, \$2,482,208; those of 1898, \$4,613,376, and those of 1899, \$5,298,125, while the first ten months of the present fiscal year show a gain of about \$2,000,000 over the corresponding months of last year. While this rapid increase is due to a generally increased demand, the countries showing the most marked growth in their purchases of steel rails from the United States are Russia, Canada and Japan.—*Scientific American*.

In connection with the above we note that according to *Bradstreet's* the exports of May exceed those of May, 1899, by 15 per cent. and if those for June do no more than equal those of June a year ago our aggregate exports for the fiscal year will closely approximate an excess over the preceding year of about \$300,000,000.

PHILADELPHIA HORSE SHOW.

THE ninth annual open air show held by the Philadelphia Horse Show Association, at St. Martin's Green, Wissahickon Heights, during the week beginning May 28, was in many respects the most successful ever held by the association. No more delightful location could be selected, nor one more picturesque when the grand stand is filled and the fine turnouts are in the ring, parading before the judges. The occasion is recognized by Philadelphia's society as a gala event, and the thousands of beautifully gowned women and well dressed men attest the hold the horse has upon the Quaker City residents. The weather was fickle, and showers interfered



CLUB HOUSE FROM THE LAWN.

somewhat with the sport, but the attendance was not exceeded by that of any previous meeting of the association. The entries numbered about 350, which was somewhat below the average, but what was lacking in quantity was fully made up in quality, and we doubt if a better percentage of extra high grade horses was ever brought together at any horse show. There was very little, however, that was new in the style of vehicles. In this respect the show was disappointing, notwithstanding there were so many finely put up turnouts. This condition can be improved upon only by the influence of some energetic lover of the horse, who is also a lover of a fine turnout; and whose good judgment and taste is recognized by those who subordinate everything to the horse, forgetting that the quality of the animal, from an artistic point of view, is greatly enhanced by the harness and vehicle. The most beautiful, high stepping horse would make a sorry show before a dilapidated buggy, while a finely proportioned carriage of the correct class, especially if the lines of the vehicle are new, will add greatly to the beauty of the animal.

We saw many attractive turnouts in the ring and on the grounds, but we doubt if there were half a dozen vehicles that were not there a year ago.

One feature of the show that proved a success was the prizes offered for ladies' turnouts, ladies to drive, not that the classes were new, but the entries were numerous, and ladies held the ribbons. In no class of pleasure carriages is there the same scarcity of styles as in this, and this condition has existed since the days of the low, scroll loop front ladies' phaeton. The light spider and the duke phaeton are recognized as belonging to, are, in fact, the standards of this class, but they do not meet all the requirements. The duke is too stilted and formal, except on the park drives, while the spider is a little too *chic* for the majority of lady drivers. As a result, other styles of a more quiet character are called for, but the one that meets with favor has not yet made its appearance. The basket phaeton is therefore resorted to, and in a measure supplies the present want. Two or three of these were shown, but aside from these there was nothing worthy special notice in this line.

The two wheelers were all of the old pattern, the tilbury predominating, but no new lines were shown, and while those used served their purpose, they did not add to the carriage builders' store of designs. It is possible that nothing better can be had, but if so it shows a lack of originality on the part of the builders. These

shortcomings are to be regretted, but they did not deprive the show of its attractiveness, neither do they reflect upon the management, which was as near faultless as could be. In fact, everything moved so smoothly that to the public, at least, there was no jarring element, and as a rule there was little to comment upon adversely as to the awards. The unsuccessful competitors naturally showed their disappointment, but there were few decided protests, all of which speaks well for the association and its official members, and is a guarantee for its continuance.

There were thirty-three classes devoted to horses in harness. Two of these were for roadsters.

Class 6.—Horse, three years old or over; to be shown to a wagon. First prize, \$100; second prize, \$50.

Class 8.—For the best roadster and best appointed turnout. First prize, \$100; second prize, \$50.

Entries in both classes were required to meet the following requirements: "When mature for single driving, should not be under 15.1 hands, and for double driving not under 15 hands high and weigh not less than 900 pounds. Their conformation, color, style of going, manners, hock and knee action, whether driven with ordinary or heavy shoes to force action, also whether strained with checking or severe bits, will be considered in judging."

In the latter class the appointments must be owned by the exhibitor, and the following scale of points will govern in judging: Horse, 50 per cent.; wagon, 15 per cent.; harness, 9 per cent.; robes, blankets and whip, 8 per cent.; general appointments, style, taste, etc., 18 per cent. Total, 100.

HORSES IN HARNESS.

Conditions: Horses may be entered in any of the harness classes for which they are eligible under the conditions as to height, and while many may be suitable for either park, road or town work, it is suggested that exhibitors will do well to consider carefully the purposes to which their horses are best adapted and enter them accordingly.

Classes 22 to 28 were for single or pairs before gigs, dog carts, phaetons, demi-mail phaeton or T cart, the vehicles not counting in the award, but the vehicles designated in each were such as were adapted to park or road work.



VIEWING THE JUDGING FROM THE CLUB HOUSE STAIRWAY.

Classes 31 to 35 inclusive, were for vehicles and appointments to be owned by the exhibitors.

Class 31.—Horse, over 14 hands 2 inches and not exceeding 15.2. To be shown before a runabout. Horse to count 75 per cent.; appointments, 25 per cent. First prize, \$100; second prize, \$50.

Class 32.—Pair of ladies' horses, over 14 hands 1 inch and not exceeding 15 hands 1 inch; to be shown before a carriage suitable for a lady to drive. Horses to count 50 per cent., and appointments, 50 per cent. First prize, \$100; second prize, \$50. First prize offered by Messrs. Blaylock & Blynn.

Class 33.—Horse, 15 hands 2 inches or over. Suitable for town

work; to be shown before a brougham or victoria. Horse to count 50 per cent.; appointments to count 50 per cent. First prize, \$100; second prize, \$50.

Class 34.—Pair of horses, 15 hands 1 inch and over. Suitable for town work; to be shown before a brougham or victoria. Horses to count 50 per cent., and appointments, 50 per cent. First prize, \$100; second prize, \$50.

Class 35.—Pair of horses, to be shown before a demi-mail, spider, stanhope phaeton or other appropriate trap* for gentlemen's park use. Horses to count 30 per cent.; carriages, 30 per cent.; harness, 20 per cent.; servants' liveries, etc., 20 per cent. Amateur drivers. The entire exhibit to be owned by an amateur. First prize, \$100; second prize, \$50. Offered by Messrs. Brewster & Co.

Class 36.—Horse, over 14.2 hands and not exceeding 15.3 hands. Owned and used for private park work since March 1, 1900, by residents of Philadelphia, Montgomery, Delaware or Chester Counties, Pennsylvania. To be shown before an appropriate vehicle. Style of going, quality and manners will be especially considered. To be driven by a lady, professionals barred. Prize, \$100 in plate. Offered by Mrs. A. J. Drexel.

Class 37.—Pair of horses, over 14.2 hands and not exceeding 15.2 hands. Owned and used for private work since March 1, 1900, by residents of Philadelphia, Montgomery, Delaware or Chester Counties, Pennsylvania. To be shown before an appropriate four-wheel vehicle. Style of going, quality and manners will be especially considered. To be driven by a lady, professionals barred. Prize, \$100 in plate. Offered by Mrs. Rudolph Ellis.

Classes 42, 43 and 44 were for tandems. **Class 45** was for unicorn teams, and **Classes 46, 47 and 48** were for four-in-hands; one only included vehicle and appointments.

Class 48.—For the best park team. To be shown before a private drag. Horses to count 50 per cent; appointments, 50 per cent. Horses entered in this class not eligible for Class 46. To be owned and driven by a member of a recognized coaching club. First prize, \$150; second prize, \$75. First prize offered by a member of the association.

Classes 49 to 53 inclusive, were for pony or pairs, before appropriate carriage.

Those classes noticed above give a good idea of the range of awards and the liberality of the association, as well as individual offers. No wonder, therefore, the show was a great success.

BUFFALO PARADE OF ROAD HORSES.

THE city of Buffalo, N. Y., has long been noted for its large number of fast road horses, and for its enthusiastic horsemen. Just how numerous these were was demonstrated on June 9, on which day the Buffalo Road Drivers' Association gave its first annual parade, on which occasion nearly 150 horses were in line. Among them were some record breakers, others without records, but speedy, and others again that, while not among the fastest, had enough speed to please the average man; to which beauty was added sufficient to draw the plaudits of the public. Behind these there were a few of the old style wagons, but the majority were the newest speeders, with naked gears and bike or other low wheels. It was estimated that \$1,000,000 was represented by the horses and fully a quarter of that amount by the vehicles. The people of Buffalo turned out in great numbers to greet the parade, and incidentally show their admiration for the horse. Among those on the track was the venerable horse breeder, C. J. Hamlin, who founded the great stock farm near Buffalo, although now eighty-one years of age. He held the reins over Belle Hamlin, the great mare, now twenty-one years old, for which \$30,000 was refused when she was in her prime.

The parade was headed by Mascot, the first horse to cut the record to 2:04. Others followed, forming a mile of fast horses and light road wagons.

Nothing will do more to prove the strong hold that the horse has on our people than such speedway parades, and to the carriage builder. They quicken the impulse to do more than ever before to produce the light road wagon, which is such a marvelous representation of the skill of the American manufacturer.

PRESIDENT PATTON, OF PRINCETON, SPEAKS OF IMPORTANCE OF CHOOSING A CALLING.

It was an inspiring procession which marched from Old North to Alexander Hall in the morning of baccalaureate Sunday, June 10. It was led by President Patton and William Libbey, university marshal. After them followed the members of the faculty, in their black silk gowns and brilliantly colored hoods, denoting the significance of their line of study. Then came the senior class, led by President Omsley Brown and William Edwards.

In his text President Patton took the words of Paul, "For ye see your calling, brethren," and said:

"I do not take these words this morning in the sense in which they were used by the apostle. What I have to say to you is determined in a large measure by the thoughts of you members of the graduating class that have been in my mind during the last two or three weeks. I realize that many of you have come to that point where you can put off no longer the choice of what you are to do in the world.

"You stand on the threshold of life, with splendid opportunities before you. Nature is uniform, and you may expect in your lives much that has been true in the experience of generations that have gone before you. It is an interesting fact that the choice you make to-day or to-morrow or the next day is going to fix your career for all time, going to determine your character largely, what books you will read, what friends you will have, whether you will travel or not. I do not wonder you hesitate as you stand upon the threshold. You may make your choice to-day, but you cannot choose the consequences that will follow this choice, and you cannot allow your most intimate friends to settle this question for you.

"Are you called to business, or are you called to a profession? I suppose that both classes are represented here this morning. Suppose I talk to you of business first. I congratulate you on having a liberal education. But let me say to you that the boy who has a high school education, who reads well, spells well, has an accurate knowledge of the ordinary operations of arithmetic and is not ashamed to learn the fundamental virtues of obedience and promptness, may get ahead of you. An A. B. diploma is not a necessary credential for copying letters and indexing letter books.

"Still, you have a great advantage, and the time will come when this advantage will show up to its full value. You have handled the concepts of volume and mass, and you can handle the concepts of coffee and cotton. You are trained for the larger processes of business which call for comprehensive knowledge, exact statement, facile powers of expression, and the ability to move as an equal among men of cultivated tastes and education. Now, you may be sure that the day is coming, if it has not already arrived, when the man in business who has not a college education is at a very decided disadvantage.

"Some of you are going into medicine. Great responsibility is given to you and great reward is coming to you. Some of you will go into the law. I want to say that you are going into a field where there are great moral possibilities and which calls for high moral aims. Some of you are going into theology. The Christian minister is the attorney general of God to speak in reference to spiritual things.

"If you are looking for a chance to show soldierly virtues, enlist under the banner of the great Captain of our salvation."

Toward the close of his sermon President Patton said: "There is a question whether there is a place not only for the exercise of benevolence, but a place where the duty of benevolence comes in. Plenty of men are benevolent with their money after they get it. How far can a man under the operation of the Golden Rule watch this process that enables him to get rich and drive his neighbor, a smaller rival, out of business? I wonder if the business man does not say that his categorical imperative is, 'Thou shalt do that always which helps the trade,' so that if a great change of governmental policy is sprung upon the nation it must be wrong if it upsets values; so that if an aggressive war is made it must be right if it gives us new markets and opens great doors of enterprise. I wonder if there is not a great danger lest the men shall forget that principle is a greater thing than interest."—*New York Herald*.

We have made justice a luxury of civilization.

No amount of pay ever made a good soldier, a good teacher, a good artist, or a good workman.

Streets and Roads—Their Construction and Maintenance.

ROADSIDE ADORNMENT.

IN the inception of a new enterprise the most necessary and fundamental features are naturally the first ones which are considered, and this has proved true with the movement for road improvement which has been developing during the last dozen years. In this case it was, first of all, necessary to show that better roads would afford commercial, social and educational advantages to the people, and after that, to provide information concerning their construction, and this same course is still of necessity pursued, reaching out gradually to new districts and attacking old prejudices and habits that have developed through generations. It has been a crusade of a most intensely practical character, offering, at first sight, no opportunities for the display of taste or the cultivation of aesthetics, and yet it is true that the perfect and complete highway may be, and should be, made so tasteful and attractive as to exert an elevating influence upon all travelers.

The complete highway is really something more than a hard surface over which travelers and vehicles may pass with comfort in all weathers; its borders should be cultivated and cared for quite as well as its stone center, and this for a triple purpose: 1. Bordering trees and hedges shield the stone from storm and sun and so preserve its surface and lengthen its life. 2. They also protect the traveler and his beast, thereby facilitating their passage and increasing their comfort and efficiency. 3. They may be so arranged, and of such character as to be beautiful to the eye, and so produce a refining influence. In short, it is the duty of the road builder to make the highways beautiful.

In a western city a gentleman who owned land on both sides of the street took away the fences and planted a quantity of buckthorns, barberry bushes, prickly ash, Japan quince and sweet briars. There were some native trees and others have been added, so that there are maples, lindens, elms, oaks, with dogwoods, syringas and viburnums. The result of this is that a stranger, on driving through, supposes that he is in a park or a private drive. The effect is most delightful, and well worth seeking. Doubtless, in this case, it is greater than could be commonly secured, but it illustrates what should be sought after. Such improvements are being made in different sections of the country; antiquated and useless fences are coming down; hideous advertising signs are being prohibited, and what has been prosaic and commonplace changes to the ornamental and beautiful.

While the best effects would naturally be produced in the residence sections of prosperous suburban and country towns, equally important effects could be secured on all roadways, thereby greatly enhancing both their utility and beauty. The science of road construction has, as yet, taken little account of these considerations in this country, but is gradually coming to include them. In such particulars we can learn much from the methods employed in France, where the best roads are built, and where they are maintained in the most thoroughly scientific and successful manner.

In France hedges and rows of trees are planted systematically along the roadsides. They please the eye, afford shade, and protect the road bed "from the softening and melting of the materials of which the roads are constructed in the summer, and the deteriorations produced by cold in winter. In fact, they do the service of a parasol in summer and of an umbrella in winter, for the water that is not absorbed and blown over by the leaves is utilized by the roots." The hedgerows retain in position the loose ground on the sides away from the road, and form a sort of wall for one side of the gutters, which are usually dug near their roots.

Trees require considerable care at first, and it is continued, though gradually lessened, until they are ten years old. For three or four years after planting the ground around them is dug up and turned, so that air and moisture can penetrate to the roots in both spring and fall, and then for three or four years more it is done only in the spring. Young trees are also frequently sprinkled. Each year, about the end of February, the trees and hedges are cleaned of the nests of harmful animals and vermin and dead parts, which are burned up. In May and August the young branches

which rise much above the general summit of the trees are trimmed off, and in the fall there is a general pruning, while from time to time, about once in three years, a general cutting takes place, so as to give vigor and abundant sap to new growths. Horticulturists are employed by the government to do the work.

If the bark of a tree is bruised or otherwise injured, or becomes infested with injurious insects, it is promptly and carefully treated to cleanse and heal it. Trees which die are immediately replaced. There are nurseries all over the country, but often a great distance from where the new trees are required; therefore small nurseries have been instituted all over the country by the State. In addition to these trees are planted in unutilized patches of ground which belong to the State by those in charge of the roads, to be used as required on the roadsides, which thus are made both ornamental and useful.

GRAVEL ROADS.

THE following, regarding gravel roads, is copied from the Report of the Commissioner of Public Roads of New Jersey for 1899:

As the State by the State aid law is more or less committed to the construction of gravel highways, and as it has already been instrumental in creating about seventy miles, it becomes important that we should thoroughly study the character of all their necessary elements, in order that this form of improvement may be made as permanent as possible. When the State and counties commenced building these we were confronted in many cases with an entire absence of gravel beds, in others with gravel pockets that although in the same bank were not uniform in their layers. There was perfect material in some pockets, sand in others, and in others loose stones, with no admixture of clay or other binder. In some localities we encountered heavy clay beds, and further along beds that were composed of loose stones with no binding material to cohere them; so we were forced to resort to various expedients in order to have a reasonably hard and permanent roadway. In many sections we practiced extraordinary care that sand be not deposited in one place, loose gravel and stones in another, and clay in another. In loading the wagons the shovellers had to be carefully watched to cause them to throw fixed quantities of each class of material upon the wagon, so that when they came to be deposited on the roadbed they would mix in proper proportions. In other cases we overcame these imperfect conditions by depositing a layer of stiff clay over the roadbed, then spreading pure gravel stones over it, and then thoroughly plowing and mixing the two materials together. We thus succeeded in creating an artificial gravel which is found to wear as well as those formations in which nature has done the mixing. In other places we found beds in which a certain kind of clay so thoroughly predominated that during the dry seasons it made a road as hard as stone; but when the wet and wintry season came the water so penetrated it that there was but little upbearing strength to it. We remedied this bad condition by covering and mixing with it a loose, sandy gravel, and thus formed a reasonably perfect roadway, sufficient for most seasons of the year. We have found that where we have placed a fairly good ferruginous gravel upon a pure sand bed (as are most roadbeds through our pine districts) we have succeeded in maintaining a surface that will stand up many years; but if the same gravel were placed upon a clay foundation there would be no bottom to the roadway in wet and freezing seasons; therefore, in the application of gravel the soil must be carefully studied, or we will produce worse conditions than we had before we commenced. In the formation of perfect gravel roadbeds it seems necessary to exercise more caution, more care, and as much knowledge as in the construction of hard roads of stone, or they will be soft in some places, hard in others, and, after a few months of wear, will present a very uneven surface that will endure a very small amount of heavy traffic. Our experience has also demonstrated that where roads are constructed through districts moderately fertile, where the traffic is not very heavy, it is in the long run more economical to construct of stone, for, if the gravel is not found near the highway, and has to be carried or carted long distances, the cost approximates so nearly that of stone that there is but little economy in its use. Another objection is that our county officials are apt to wait too long before giving them needed attention. The stone roads can stand neglect for weeks or months, and not, in many cases, be very materially damaged or the traffic much interfered with; but the gravel road needs frequent scraping and filling when the traffic is heavy or the weather renders it soft. All public works should be of more substantial character than those owned by individuals or corporations, for pecuniary considerations influence them to greater attention than

when controlled by public officials. Therefore, we do not think it the part of wisdom for the State to enter into the construction of gravel roads except in poorly settled communities and in farming or pine districts, where gravel is abundant, and where the source of supply is near the roadbed.

The State and counties have created some very pretty roadways of gravel, which are at present the pride of the districts through which they run. They form fine, easy paths for the passage of moderately weighted vehicles, and are about the only roads that many of these localities can afford to build; but in thickly settled farming districts the temptation to build is so great, on account of their comparative cheapness, that it is not amiss to caution against entering too heartily into their construction, especially as our experience has been that it is often very difficult in these neighborhoods to discover gravel of sufficient binding and wearing qualities to make a durable roadbed. The petitioners are often deceived as to the amount of material nature has deposited in their localities, so they have several times been forced to change their specifications and readvertise for stone, thus losing the State appropriation for that year. It is our impression that on many of the highways that are being constructed of gravel, the freeholders, in order to maintain their integrity, will in time find it more economical or absolutely necessary to spread a few inches of broken stone, for the law compels them to maintain a hard surface to State aid roadbeds, and it will be absolutely impossible to do so with the gravel that is located along many of them. Some of the old gravel roads that are almost perfect in summer are at the worst in winter, being at times almost impassable. For several of these we have been persuaded by the residents along them to approve of specifications to regrade and cover them with stone; thus experience demonstrates that truly permanent highways can only be made of stone. If we could make our gravel highways by sifting all the material through meshes of different sizes, in order that gravel containing too much earth or clay could be rid of the superfluity, and then all the necessary elements mixed in proper proportions, we might make a roadbed which, although more expensive, would wear for a long time.

Roads constructed over clay soils should have at least six inches of coarse gravel mixed with the clay, so that under the weight of traffic the stones would be consolidated so completely with the clay that they would prevent the surface water from percolating through and softening it. Before placing the gravel upon any road, great care should be exercised to bring the roadbed to a proper grade, eradicating all ruts, mud holes or depressions. A good, even, regular, solid foundation should be even more completely obtained than where stone is used, and to properly place the gravel it should be put in layers and each layer thoroughly rolled and mixed; where it is too dry to properly consolidate, water should be used. I have seen a few gravel roads that are almost as hard as stone, but they are principally those where natural conditions have unwittingly entered to produce the proper combinations; but the majority of these roads present no such conditions. Therefore, extreme care must be continually exercised in their construction, in order that art can assist in forming perfect roadbeds.

PRICE OF STRUCTURAL STEEL REDUCED.

THE structural steel manufacturers, at a meeting held at the Holland House, New York, on June 15, decided upon a reduction in the price of their product, to correspond to the decline in the cost of raw material. The reduction made, however, seems to be more radical than was at first estimated, amounting to \$7 instead of \$5 per ton.

At the meeting were representatives of the Carnegie Co. and Jones & Laughlin Co., of Pittsburg; the Pencoyd Iron Works, of Philadelphia; the Passaic Rolling Mills Co., of Passaic, N. J.; and the Cambria Iron Works, of Johnstown, Pa. These companies, with one or two others, form the "beam pool," as the "gentlemen's agreement" between the manufacturers of structural steel is known.

At the meeting the schedule of prices fixed for New York delivery on beams and channels was 2.05 cents per pound, or \$41 a ton, against 2.4 cents per pound, or \$48 per ton, as formerly. The price of angles was fixed for New York at 1.95 cents per pound. The previous schedule for beams and channels was 2.25 cents per pound at Pittsburg, and 2.4 cents per pound in New York. The relative difference of 15 cents per 100 pounds between New York and Pittsburg prices will, it is understood, be maintained as formerly.

Dealers' Department.

CONVENTION OF THE DEALERS' PROTECTIVE ASSOCIATION.

THE eleventh annual convention of the National Carriage and Harness Retail Dealers' Protective Association promises to be a large and interesting gathering. Many new members have been added to the association during the current year, and some new questions have arisen that will without doubt receive consideration in the open meeting. The meeting will be held, as heretofore, in one of the assembly halls of the Central Palace, Forty-third street and Lexington avenue. The exhibit of finished carriages will be held at the same time, and, judging from the number of applicants for floor space, the exhibit will be a large one. As yet, no official notices have been sent out, other than those pertaining to the finished carriage exhibit. The officers of the association are: V. T. Van Fleet, president, Somerville, N. J.; George Bohon, vice-president, Harrodsburg, Ky.; William Ranken, secretary and treasurer, Troy, N. Y., with vice-presidents from all States represented by membership in the association. Among the rules are the following:

"All dealers in carriages, wagons and sleighs, carrying a stock of six new four-wheel vehicles for sale, who are residents of the United States, shall be eligible to membership in the association.

"The initiation fee shall be \$5 and the annual dues shall be \$2, payable in advance."

Following these are the penalties prescribed and the duties of the officers, after which is the following:

"This association pledges itself as an association and as individuals, not to buy goods from any manufacturer or wholesale dealer that are known to trade goods in the carriage or harness line for varnish, advertising, wheels, etc., or who sell goods in the carriage or harness business to anyone not a dealer in such line, in any city, town, village or section where there is a legitimate dealer. Manufacturers may sell goods in the carriage and harness line in their regular established repositories, if sold at an advance of not less than 25 per cent. over and above net wholesale price.

THE MUTUAL RELATIONS BETWEEN DEALERS AND MANUFACTURERS.

AMONG all the phases of this question there is none more important than that of its proper appreciation by dealers. That would seem at first glance like "bringing coals to Newcastle." With the dealers all over the land organizing associations and demanding protection from and by manufacturers, it may seem preposterous to say that dealers do not appreciate the importance of the subject.

But when it is remembered that this organized movement is comparatively recent, that although it began some ten years ago it has gained no impetus until within the last two years, and that out of the great body of dealers comparatively a small number are even yet affiliated with any association, the statement which we make is not so strange after all. In fact, we have pursued this line of discussion for the past twelve months because of a certain apathy which seemed to exist in some quarters, because the general good of the trade demanded that the work be helped along, because the number of dealers far exceeds that of the wholesale manufacturers, and a larger missionary work had to be accomplished. Nor have dealers yet realized how much good can be accomplished by organization. With it comes an intelligent understanding of the difficulties as they really exist, of a greater confidence in each other, and of a juster, as well as more efficient, plan of operation.

A manufacturer must be equable in his conduct towards dealers. He is catering to their wants and is desirous of doing all in his power for their interests. But with 40,000 differing notions he would have a hard row to hoe. It is essential that some plan of conducting and controlling the mutual relations between manufacturers and dealers shall be agreed on.

We are compelled to say that the dealers' associations are not yet harmonious among themselves, neither in defining what shall constitute a legitimate dealer, nor in many other points. We are compelled to say that the dealers have not yet fully comprehended the greatness of the work upon which they have entered. Their dis-

cussions and associated efforts have not yet taken on that breadth which is essential to the harmonious and effective unification of the trade. The questions involved are larger than the self interests of any local dealer force upon his attention. The large brained man who will think for the whole trade, who will present the issues in practical shape and mould the work of the combined associations on just and uniform lines, has not yet come to the surface. The time has not ripened for such a man. If it had it would not be necessary for us to be urging dealers to a realization of the importance of conserving the welfare of the mutual relations between manufacturers and dealers.

Dealers are a power and manufacturers are a power. Both sides have their complaints. The dealer need not think that he alone suffers. The petty annoyances which seem so grievous to a local dealer and overshadow his business life are not the most important matters. The larger questions embrace the less. The health of the whole body of dealers involves his own welfare. When dealers learn to grasp a policy which shall be broad enough to concern all the members of the trade, which shall be considerate of the rights of all, which shall protect the mutual relations between themselves and between dealers and manufacturers, then they will have solved the problem which is before them. So far they are merely laying the foundation for future action, and it is important that the superstructure be considered, and the foundations be broad enough to bear it.

We have endeavored in these articles to broaden the view in the larger interests of the trade, so that a grand plan may be evolved, through the action of many minds, for a definite purpose. Manufacturers have realized for many years that they were powerless by themselves to bring about an adequate system that would afford satisfactory protection to the trade. The old method of selling to but one dealer in a town was good so far as it went. It made dealers where none existed. In a measure it afforded protection. The granting of a prescribed territory by a manufacturer to a dealer for the exclusive sale of his products is the only form of real protection which manufacturers have adopted, and that not by agreement nor because any body of dealers has required it, but as a business necessity, which originated long before dealers thought of organizing.

It is the modern half retail and half wholesale concern which has created havoc in the trade. The acute stage of the trouble has been brought about by the lack of cohesion among dealers and among manufacturers, and both ignoring those mutual relations which should be religiously preserved, until the manufacturer could not count on a dealer giving his goods fair representation, and the dealer could not count on the manufacturer protecting him in a territory which yielded no business. Naturally, the manufacturer concluded to take the selling to consumers into his own hands, and make a market for his goods. His success created a howl. The dealer was hurt. He retaliated by boycotting the manufacturer. Both sides were brought to consider the question of fair play, and the mutual relations between manufacturer and dealer assumed at once a position of profound importance, appreciated, we believe, by the manufacturer with intense solicitude, but solvable only by the dealer. What is his plan? How will he do justly? The whole remedy lies in his hands. It consists in giving to the manufacturer an open market for the sale of his goods, but so that all sales shall be through the dealer.

Now, it seems to us most essential that all dealers become members of a dealers' association. For, with only a small minority as members, as at present, their efforts will be annulled by the non-members. This is why we are urging dealers to a more realizing sense of the importance of united action for the preservation of those mutual relations between manufacturer and dealer which, it is evident, only organized effort can accomplish, and that on a large scale, embracing the entire body of dealers.

One step at a time, and the first one is organization. But it is a mistake to draw the line of qualification too tightly at first. The main point should be to get dealers in, and not to shut any out. In this respect we think the dealers' associations have made some mistakes, and very serious ones. But these can be remedied, and probably will be, when the various associations appoint their delegates for a general congress, as will be done in the course of time, we have no doubt. So far, their organized efforts are in the formative period. They have not fully waked up to the greatness of the work before them, and its immense commercial value. Much missionary work must be done, and done largely by the trade journals, as the most available means of disseminating the best thoughts of progressive minds.

After organization is effected, wisdom and moderation must govern, or the whole structure will fall. Sound business principles must prevail. All the dealers combined represent but one side of the questions involved. The interests of the manufacturers are just as great, but the manufacturers are fewer in number, and can act more promptly. They desire to assist the dealers, and will do so as a plain business proposition that needs no debate. It is, first of all, a question of who are dealers? But if the dealers themselves cannot agree on an answer, the manufacturer is forced to decide for himself. Again, if the dealers shall agree, but insist on keeping secret the names of those admitted to membership, the manufacturer must still be left to decide, and to make dealers where he can. Only by co-operation can the mutual business relations between manufacturer and dealer be sustained. So long as dealers assume that the manufacturer is their enemy there cannot be that confidence, and its reciprocal benefits necessary to the completion of the protective idea in its practical application.

The successful dealer is apt to ignore the importance of urging organization on his less successful brothers in the trade. But the competition from which he suffers most is from that class who, without organization, prove a source of weakness in his own ranks, but with organization would add to his strength.

The stronger must help the weaker, that in the end he may help himself. Full co-operation among dealers is essential to the preservation of harmonious action, the destruction of wasting competition and cutting of prices among themselves, before they can hope for success in regulating their troubles with the manufacturer.

In the meanwhile, the manufacturer is patiently awaiting the gradual unfolding of their plans, and is ready and anxious to assist along practical lines.

"KEEP TO THE RIGHT!"

"Keep to the right," is the law of the road—
Make it a law of your moral code;
In whatsoe'er you determine to do,
Follow the road of the Good and True;
Follow and fear not; by day and by night,
Up hill or down hill, "keep to the right."

Doubt will assail you, temptation will woo—
"Keep to the right," for the right is the true;
Doubt is a traitor, temptation a shame;
A heart that is honest, a life without blame,
Will rank you far higher, in worth and renown,
Than the grandest of kings with his sceptre and crown.

"Keep to the right," in the journey of life—
There is crowding and jostling, trouble and strife;
The weak will succumb to the bold and the strong,
And many go under and many go wrong;
He will acquit himself best in the fight
Who shirks not his duty, and "keeps to the right."

"Keep to the right," and the Right will keep you
In touch and accord with the Good and the True;
These are the best things in life, after all,
They make it worth living, whatever befall,
And Death has no terrors, when he comes in sight,
For the man who determines to "keep to the right."

—Charles W. Hubner, in *Atlanta Constitution*.

ANOTHER GREAT YEAR FOR EXPORTS.

In 1899, for the fourth time in the history of our foreign commerce, the annual value of domestic merchandise exported by this country exceeded a billion dollars. The first such record was made in 1892, when the declared valuation amounted to \$1,015,732,011. In 1897 they were \$1,032,007,603, and 1898 scored the unprecedented value of \$1,210,253,513. Then came 1899, recording \$1,206,931,222. The 1899 total imports were valued at \$697,148,489, much below the average for the last decade, but considerably above the 1898 figures.

In 1899 the excess of domestic exports over imports reached \$506,782,734, and of agricultural exports over agricultural imports \$437,296,852.

The foreign agricultural exports purchased here during 1899 had a value of \$355,514,881, or over \$31,500,000 less than the average for the entire ten years preceding.

HYDE PARK, LONDON.

(From THE HUB's special correspondent.)

THE New Yorker takes pride in Central Park, with its graded walks and drives, its well wooded retreats, its bits of nature and its landscape gardening, as well as its lawns, and when fashion has its drives on a pleasant afternoon he is unwilling to believe that there are any other parks that equal it. I am one of those, or rather, I was one, but after spending two afternoons in Hyde Park, London, I no longer wonder why the Londoner loves this beautiful park. It lacks much of what to me is so beautiful in our Central Park, but it has its lawns, which in color and density so far outstrip any I have seen in America that I feel I could forego many of our beauties for this one.

The carriages of the nobility are models as to their equipments; the coachmen and grooms are staid and precise; how they maintain their attitudes is a puzzle. There is nothing democratic about the turnouts. The heavy carriages do not differ materially in form or color from those of wealthy New Yorkers, but much more attention is paid to harnessing and harness, and we see more of the real coach horse. An occasional novelty is seen in London in an old pattern family coach, with hammercloth seat and the livered coachmen and footmen in red coats, powdered wigs and cockades. It seems all right here, but this outfit would appear ridiculous in Central Park. However, I like the correct deportment of the coachmen and footmen, and the manner in which the horses are harnessed, but I miss the light American vehicles and the variety of styles. Here the broughams all appear to be built in two patterns only, while there is very little variety in cabriolets or driving phaetons. Pony carts are abundant, and ponies, from the most diminutive up to the small horse, are seen in great numbers, and, by the way, this is a feature more noticeable outside of London than in. One can hardly hire a horse in the small towns, ponies and jacks seemingly having crowded the larger animal out. It is no uncommon thing to see one of these diminutive ponies hitched to a big four wheeled trap. But this is a digression, as I was confining my remarks to Hyde Park. While seated, enjoying the sight of so many well equipped carriages and fine horses, I heard a noise that reminded me of the wholesale milk wagons passing over the paved streets in New York at an early hour in the morning. Soon after I saw an automobile passing me at a distance. It was a heavy affair. The passengers were sitting in the body, on a level with the motorman; the motor was in a box in front. It was a clumsy affair, but seemed to move all right. It was the only motor vehicle I saw in a half day.

I had heard much of Rotten Row, and I enjoyed seeing the great number of gentlemen and lady riders, also seeing so many children, respectfully attended by a portly, dignified groom, riding at a respectful distance behind them. This groom is frequently dressed in black, and wears a high hat with a pom pon, signifying the rank of the family, said pom pon being taxed.

The ladies' habits are very short, too short to look well, I think; the coat is tight fitting, buttoned to the waist, cut with long waist and extremely long coat tails, sweeping the horses' backs in some instances. There are many young gentlemen riders. I noted one who wore white duck breeches, mixed gray tight fitting riding coat, tan Derby hat, black shoes and tan leggings. Quite a showy outfit, I thought. Many of the gentlemen riders do not wear straps or leggings, but turn their trousers up, and as these ride up they present a most awkward appearance.

When riding and driving is at its height the promenades are crowded with well dressed people, and ample accommodations are provided for those who wish to sit. The children play upon the lawns, and the entire scene is one of a most pleasing character.

I saw far more fine carriage and saddle horses than I saw in New York, but I missed the light trotter and the light road wagon, also the light four passenger family vehicles of the surrey class. These the English do not appear to take kindly to. If there is a family turnout without coachman or groom, it is likely to be a cart or some light four wheel trap. In this respect I give preference to Central Park. It indicates greater freedom of action, more general participation in the pleasure of the drive than do the staid, dignified and perfectly equipped heavy carriages of Hyde Park.

Aside from the well trained coachmen and correctly harnessed horses, I do not see that the citizen of New York has anything to learn from the aristocrats of London. In fact, I believe that the American brougham is, as a class, a more attractive vehicle than the

London brougham; it has all the elegance of the French vehicle, and the stability and quiet of the English. If our people would harness horses as well, and train their coachmen and footmen to understand their duties, the American gentleman's outfit would shine conspicuous, even in such an autocratic, aristocratic gathering as that to be seen in Hyde Park.

CARRIAGE, WAGON AND DEALERS' ASSOCIATION OF BUFFALO, N. Y.

At the election of the Carriage, Wagon and Dealers' Association of Buffalo, N. Y., held on June 4, the following were elected to office: President, Mr. George Werner; vice-president, Mr. C. J. Handel; treasurer, Mr. R. Shepert; secretary, Mr. Fred Meyer; executive committee, Thomas Derry, David Justin, John Duchman, Henry C. Ladd, Leroy A. Weller, John F. Vogt, Charles Bosche, David F. Rieman, Jr., Peter Lesswing.

This organization has just been formed, and, judging from the large attendance, there being three-quarters of the carriage men of Buffalo present, is bound to be long lived. After the general routine of business, Mr. Werner, in a felicitous speech, invited the members to a bountiful spread, where good fellowship prevailed until early morning. Among the guests was Charles Fullgraf, of the Parrott Varnish Co.

THE THIRD MEETING OF THE AMERICAN VEHICLE WOODSTOCK ASSOCIATION.

HELD JUNE 6 AT THE GRAND HOTEL, INDIANAPOLIS, IND.

THE largest meeting ever held by this association was called to order by Mr. B. F. Von Behren, president, at 10:30 A. M.

In addition to the large number of charter members present, the following firms were represented:

Hodgenville Spoke & Lumber Co., Hodgenville, Ky.; M. E. Campbell, Tullahoma, Tenn.; R. Davis & Sons, New Castle, Ind.; Odon Manufacturing Co., Odon, Ind.; A. Votaw, Winchester, Ind.; Hartwell Bros., Vincennes, Ind.; Kyle & Ford Co., Akron, O.

This now makes the membership reach fifty-eight, showing a constant increase, and there are splendid prospects of many additional names being enrolled the next few days.

After the reading of the minutes, the various committees made reports and a general discussion of trade followed. The volume of business is reported as about 25 per cent. less than last year. The question of the supply of lumber and logs suitable in quality for this line of manufacture was dwelt on at some length, and from all reports there is only one conclusion to arrive at—that the supply is growing much less, the quality not so good, but the price much higher, and the percentage of waste much greater than heretofore, necessarily compelling the vehicle woodstock manufacturers to get more for their product. The prices adopted April 4, 1900, will be maintained.

Adjourned at 12:45 to meet at 3 o'clock.

AFTERNOON SESSION.

The meeting being called to order, the election of directors followed, with this result:

M. R. Campbell, of Campbell & Dann Manufacturing Co., Tullahoma, Tenn.; Peter Lesh, of Weis & Lesh Manufacturing Co., Jackson, Tenn.; H. J. Kimble, of H. J. Kimble Bending Works, Zanesville, O.; E. K. Cunningham, of Cunningham Manufacturing Co., Fostoria, O.; W. A. Snyder, of Pioneer Bending Co., Piqua, O.; C. A. Russell, of Toledo Carriage Woodwork Co., Toledo, O.; J. D. Cone, of Cone & Jones, North Vernon, Ind.; J. W. Von Behren, of Von Behren-Russell Co., Louisville, Ky.

Many other matters of great importance were taken up, and a committee was appointed to consider the raising of a fund of \$6,000 to \$8,000 for the purpose of giving the organization the necessary backing to carry out some important plans and special features of the association.

It was agreed by all present that the association had already done much good, and was on a permanent basis. That they would soon convince every manufacturer of this line that he would be better off socially and financially in the association than out of it.

At 7 P. M. the meeting adjourned to meet at the call of the president.

The board of directors met at 8 P. M. in executive session, when much was done that will be of benefit to the association.

Automobile Department.

THE GROUT BROS.' SELF-PROPELLED VEHICLE.

(See illustration on page 157.)

THIS automobile was designed to fill the demand for a vehicle having lightness, ease of operation, speed, economy and for hill climbing. It is a steam vehicle, very compact, no noise or vibration. The best of material is used, and the workmanship is equal to any and is guaranteed. Every part is made at their own factory at Orange, Mass. The body is hung on four points resting on springs, making it an easy riding vehicle. The body contains the engine, boiler and tanks. No speed changing gears are used, but connection is made direct from engine to the compensating gear on rear axle, and the change of speed is accomplished by the throttle of engine, the same as a locomotive. These vehicles have a speed of about fifty miles an hour, but can be run as slow as the slowest dray, making them a vehicle that can travel among the busiest city streets, and can also be reversed and run back as easily and quickly as forward. Gasoline is used for fuel by vaporizing, there being about 45 square feet of heating surface. Steam can be made as fast as in any possible way. The gasoline is fed to vaporize by compressed air stored in a tank with gauge to indicate pressure. The engines are double acting link motion, with ball bearings. Frame of phosphor bronze; gray iron cylinder. Other parts drop forgings and steel and very best of workmanship, very simple, anyone being able to put one together. The boilers are copper, with 300 tubes tested to 600 pounds, cold water pressure. The running pressure is 165 pounds, which will operate the automatic valve keeping the steam at this pressure, not allowing it to go over. The safety valve is set at 225 pounds. Steam gauge on dasher indicates the exact pressure in boiler. Water glass on outside of carriage, but can be placed inside in cold weather. Water is supplied to boiler by pump worked by engine, and can be regulated by the operator, keeping water at any desired height. These boilers are perfectly safe and cannot explode. The compensating gear is used on the rear axle, allowing for the turning of corners. All tanks in carriage are made of copper and have a capacity for thirty miles; larger tanks can be used. Wheels are 28 and 30 inches by 2½ inch tires. The care of one of these vehicles is the same as a fine carriage and nice piece of machinery. Cleaning and oiling are the essential features.

THE LOUTZKY AUTOMOBILE SYSTEM.

(See illustrations on page 156.)

THE four illustrations on page 156 represent the vehicles fitted up on the Loutzky system, a German invention. The vehicles are manufactured in Berlin, and are sufficiently novel to warrant their reproduction and a general description. At a recent exhibition in Berlin this company showed one mail wagon, two self-driving coaches and two tricycles. The mail wagon has seats for two persons located in the rear, high enough to have a sufficient view over the coach. The mail box, ¾ cubic meter capacity, is located in front. The wagon corresponds with the smaller mail carriage in service of the German post, and principally in use for carrying mail bags and smaller packages, conducted from the right side. The total mechanism of this wagon is in the rear, directly below the seat. The benzine reservoir, with a capacity of 30 liters, is located below the reservoir in the motor, hanging on the so-called carrying pipe of the wagon. It is a vertical twin motor of 5½ horse power, with a water-cooler of the so-called cylinder heads. A small centrifugal pump sucks up the hot water from the motor, and effects its flowing back through long copper pipes to the cool water reservoir. This is located before the mail box and is covered by a large brass eagle, which produces a very favorable effect in front of the wagon. The reservoir contains 20 liters of water. The wagon has two direct transmissions.

The motor carriage weighs 150 to 200 kilos, and it is an easy matter, at that weight, to put the wagon in motion. This wagon of two horse power overcomes elevations of from 7 to 8 per cent. The motor and the whole mechanism of this wagon is located at the rear

part of the wagon. The motor has simple rib coolers. The speed of the wagon depends on whether the motor is fitted out with a one cylinder or two cylinder machine. In the first case the speed on a good road will be 20 to 25 kilometres; in the latter case 30 to 35 kilometres an hour. This wagon is fitted out with a light canvas top to protect it from the rain.

THE FRIEDMAN AUTOMOBILE.

(See illustration on page 157.)

THE Friedman automobile, illustrated on page 157, built by the Friedman Automobile Co., Chicago, Ill., shows another departure in the building of motor vehicles. The designers started out with a view to the production of a light, powerful and simple machine, one that could be operated with safety by anyone who would give it a little study, and be run at a small expense. They chose gasoline for developing power and an engine having two opposed cylinders, four cycle, developing three horse power, jump spark igniter and self circulating water system for cooling, with speed from starting up to twenty-five miles an hour. The control is simple, the guiding lever practically controlling speed and direction. They patterned after the system adopted by the people of France, the home of the automobile, and have built their automobiles so that every piece of the machinery is instantly accessible and readily detached. They claim that there is no gasoline vehicle more easily mastered than theirs; none in which the adjustments can be more readily made, or which in its operation and range of usefulness will give better satisfaction. Recognizing that the trend of all manufacturers of automobiles is toward simplicity, they have kept this one point in view above all others, and have discarded all methods not easily mastered, employing all their skill toward perfecting an automobile which can be handled by women, as well as men. They have combined the best results of the foremost French engineer with American ingenuity and mechanical skill, and have produced a light vehicle that can be handled as dextrously as a bicycle. The vehicle is so constructed that it can be cleaned by turning a hose on it, without affecting any of the mechanism.

THE "CUNNINGHAM STEAM WAGON."

(See illustration on page 157.)

THE Cunningham steam wagon was built by the Cunningham Engineering Co., at its shop, 118 West Brookline street, Boston. Its weight is four and one-half tons, and its carrying capacity six to eight tons. This wagon has been run on the streets in Boston frequently during the fall and winter. These trial runs have demonstrated the entire practicability of the wagon, and have assisted the company in determining where improvements could be made, particularly in the line of more economical and smoother working. New designs and working drawings incorporating the improvements have been made, from which two more wagons are now being constructed. One wagon of the new design is very nearly completed. They are designed to carry eight to ten tons, the weight of the vehicles to be five tons. The company has a well-equipped machine shop of its own, where about twenty men, draughtsmen, machinists, iron workers, steam engineers, etc., are continually employed on the preparatory work of constructing steam motor wagons for heavy traffic. The purpose of the company is to engage in the business of furnishing steam wagons for carrying heavy merchandise, coal wagons, ice-delivering wagons, watering carts, etc., ranging in capacity from two to ten tons, the present equipment and force of men being merely the nucleus of more extensive operations. While the company has no hesitation in saying that their wagons will do the work satisfactorily, it believes the more conservative procedure of showing vehicles in actual working operation before soliciting orders will result in establishing itself more completely in the confidence of purchasers. Most complete information in regard to the wagons being constructed by this company can be obtained by addressing them.

THE Reuter Automobile Co., of Chicago, was chartered at Dover, Del., to manufacture, sell and deal in all kinds of automobiles and horseless carriages; capital, \$300,000.

AUTOMOBILE PATENTS.

ELMER A. SPERRY, of Cleveland, O., was granted a patent for a motor carriage, dated February 13, 1900, No. 643,257, illustrated by Fig. 64.

Claim.—1. In a vehicle, a non swiveling forward axle, a vehicle step on such axle, a body for such vehicle, and a swinging door or gate in the front panel or body part near the step. 2. In a carriage,

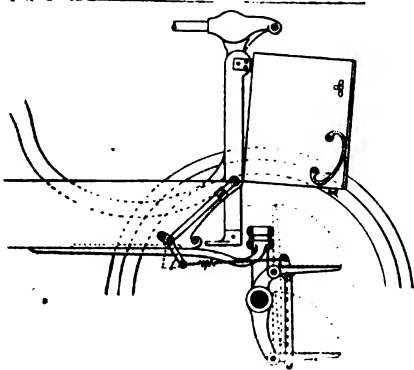


FIG. 64.

a swinging dasher for the carriage, folding steps for the carriage, and a connection between the dasher and the steps for folding the same when the dasher is in a predetermined position. 3. In a carriage, folding steps for the carriage, mounted upon the running gear or axle, an actuating device for actuating the step or steps mounted upon the body, and resilient connection from the actuator to the steps.

HIRAM A. FRANTZ, of Tamaqua, Pa., was granted a patent for a motor vehicle, dated March 6, 1900, No. 644,590, illustrated by Fig. 65.

Claim.—1. In a motor vehicle, the combination with a frame, of mechanism in said frame for driving said vehicle, flexible means

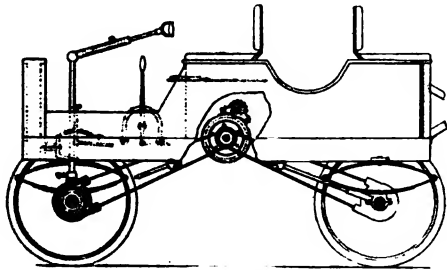


FIG. 65.

for communicating motion from the driving mechanism to the front and rear axles, springs between said axles and frame, and radius bars connecting said axles and frame.

CHARLES O. HIGGEM, Massillon, O., was granted a patent for a motor vehicle, dated March 16, 1900, No. 644,598, illustrated by Fig. 66.

Claim.—1. In a fluid pressure motor for vehicles, the combination with a main driving shaft or axle, a pair of arms pivotally

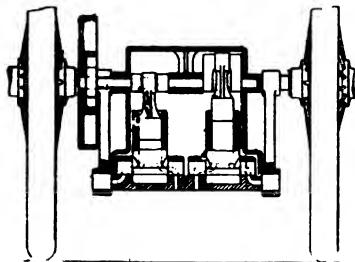


FIG. 66.

mounted thereon, a motor housing carried by said arms, one or more motors pivotally mounted in said casing, an inlet and an exhaust port extending through said casing and communicating with said cylinders, a crank shaft mounted in bearings in said housing, pistons adapted to reciprocate in said cylinders, connected with said crank shaft, a clutch member carried by said main driving shaft or axle, and another clutch member carried by said crank shaft, means for swinging said housing to cause said latter clutch member to engage with the former clutch member.

ANTHONY BINT, of Stockton, Cal., was granted a patent for a motor vehicle, dated March 6, 1900, No. 644,843, illustrated by Fig. 67.

Claim.—1. In a motor vehicle, the combination of two rotatable axles, wheels loosely mounted on the axles and having suitable notches in the hubs thereof, suitable clutches rigidly attached to

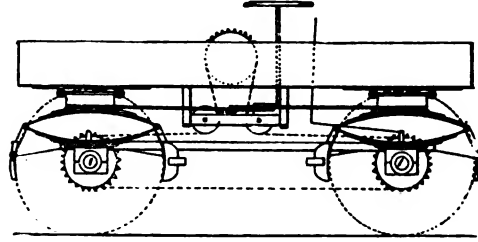


FIG. 67.

the axles, and adapted to engage with said notches in each of the hubs, a suitable fifth wheel journaled to the center of each axle, a reach attached to and connecting the said fifth wheels, a suitable sprocket or grooved wheel attached to the center of each axle, a suitable chain belt adapted to engage with said sprocket or grooved wheel and a power wheel located in the body, guide pulleys located beneath the body, and the body aforesaid, mounted on bolsters, said bolsters mounted on springs which are journaled on the axles.

EUGENE FAHE, of St. Louis, Mo., was granted a patent on a motor vehicle, dated March 6, 1900, No. 644,853, illustrated by Fig. 68.

Claim.—In a motor vehicle, a frame, suitable traction wheels on which said frame is arranged, means carried by the frame for

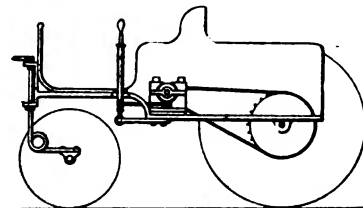


FIG. 68.

driving the rear pair of wheels, a pair of vertically arranged shafts journaled in the forward portion of the frame, springs integral with the lower ends of said shafts, the ends of which springs are bent rearwardly, and journal boxes secured to said rearwardly bent ends in which the sub-axles of the front wheels operate.

JOHN E. THORNTON and **JAMES P. LEA**, Altringham, England, were granted a patent for a motor surrey vehicle, dated March 6, 1900, No. 644,950, illustrated by Fig. 69.

Claim.—1. In a motor driven vehicle the combination with the body and ordinary wheels of a traction frame hinged to the axle by a pivoted joint, a motor and traction wheel carried by the traction

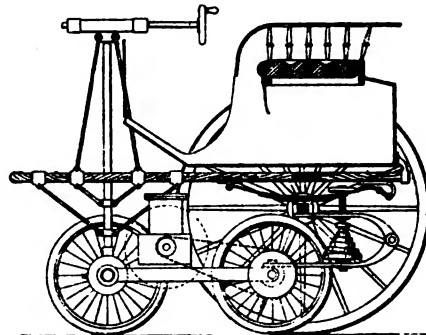


FIG. 69.

frame, pivoted connecting levers by which the traction frame is connected at its other end of the vehicle, and a spring inserted between the levers to regulate the pressure of the traction wheel upon the ground.

SHIPPED AUTOMOBILES TO MEXICO.

New York capitalists engaged in the manufacture of electric vehicles have already shipped a number of these vehicles to the City of Mexico, to the order of the Mexican Electric Vehicle Co., which holds concessions for electric coach and omnibus service there. Contractors have begun paving 130 streets in Mexico with street asphalt, which in view of the level character of the ground will make that city an ideal automobile town.

THE PARIS INTERNATIONAL AUTOMOBILE RACE.

THE race for the International Automobile Cup, from Paris to Lyons, a distance of 351 miles, was run on June 14, M. Charron, with a Panhard-Levassor machine, being the winner in the short time of nine hours nine minutes. For this race there were five starters, Messrs. Charron, Girardot and René de Kuyff, of France; M. Jentzy, Belgium, and Alex. Winton, of the United States. Of these, two only covered the course, Messrs. Charron and Girardot, the three others retiring before covering half the route.

ELECTRIC OMNIBUSES.

THE Philadelphia Record is responsible for the following:

"Within ninety days there will be in operation on the streets of Chicago a line of fifty electric motor omnibuses of unique design, which will enter into competition with the various street railway systems of that city. The striking feature of these vehicles is that they will be operated by the hub motor system—each of the four wheels is to be supplied with an independent motor. These vehicles will be double decked, 23 feet long and 13 feet over all in height, with seating capacity for forty passengers—eighteen inside and twenty-two outside. In general construction and seating arrangements these new vehicles resemble the buses which were operated on Broad street in this city some years ago.

"Each of the four motors will have a normal capacity of six horse power, but is designed to stand 100 per cent. overloads for half an hour. The external diameter of each hub will be 16 inches, while that of the wheel itself (shod with 6 inch punctureless pneumatic tires) will be 40 inches. Each wheel will weigh about 500 pounds complete. The batteries will contain eighty cells and weigh 4,000 pounds each, and the battery trays, suspended beneath the body of the vehicle, will not be removed by means of a pit, but from one side, a freshly charged set being substituted from the opposite side. One charge of the battery will, it is believed, propel each vehicle thirty miles at the rate of twelve miles an hour. Three speeds will be provided—three, six and twelve miles an hour—the controller being similar to that in common use on the city trolley cars.

"Forty incandescent lamps of nine candle power each will be used for lighting the interior of the vehicle and the headlight. Each bus will be supplied with a fender. The total weight of each vehicle complete, without passengers, will be about six tons. The company operating these buses intends to adopt a 'no seat, no fare' rule, limiting the number of passengers to the seating capacity. Five cents fare will be charged, regardless of the length of the ride. The interiors will be handsomely upholstered, and electric push buttons will be provided at each seat.

"Some of the advantages claimed for the use of the hub motor in vehicles of this character are: Almost entire absence of slippage, even on snowy or muddy streets; with four points of contact every pound of weight is available for adhesion to the ground. Economy of operation—one, two, three or four motors may be used, as desired; advantage may be taken of an 'empty' run by cutting out one or more motors; on down grades all four may be shut off; should one or more motors become disabled the vehicle may be readily operated with the others. With four motors, neither of them is often called upon, to exert the horse-power of which it is capable, and not being subjected to excessive strains, the repair account will be greatly reduced in comparison with single-motor systems. With the four-motor equipment the maximum speed is attained much more readily than with other systems, strains on the batteries being thus avoided. Should an accident happen to any one or even two wheels, other wheels without motors may be substituted until the injured wheels are repaired. The sending of cars to the repair shops for weeks at a time is thus avoided."

AUTOMOBILE CLUB, OF ROCHESTER, N. Y.

A MEETING of the board of governors of the Automobile Club of Rochester was held at the Livingston Hotel June 9, at which the following committees were chosen: Membership, Joseph J. Mandery, chairman, C. J. Conolly and Frederick Sager; Auditing, C. M. Everest, chairman, James S. Watson and Dr. E. J. Bissell; Tours and Runs, F. H. Bettys, chairman, J. H. Sager and Park Densmore; Ordinance, George Eastman, chairman, Dr. W. A. Keegan and George Foster. The club is steadily increasing its membership, and a number of automobile owners from out of town have been admitted as associate members.

AN AUTOMOBILE HIGHWAY.

THE automobile enthusiast can claim recognition as the Utopist of the century. Nothing seems too great for his accomplishment. The following is his latest dream:

"An automobile highway system, about 500 miles long and to cost about \$3,000,000, is being discussed among property-holders in the scenic section of New Hampshire," says the *Engineering News*. "The road would start from Boston and pass through Lexington, Concord, Dublin, N. H., and on to Keene. From Keene it would cross to Lake Sunapee; then branch to the Corbin deer-park: pass to Springfield and Hanover, to the Connecticut lakes; through the White Mountains to Plymouth, and down to the Maine coast and back to Boston along the sea coast. President Chamberlain, of the Automobile Association of America, is said to be deeply interested, and proposes connections through the Berkshires. The roads would be macadam, and it is estimated that they could be constructed in five years. Toll stations may be established, and all but pleasure vehicles excluded from them. In the latter point will come the opposition and difficulty."

MOTOR VEHICLE CORPORATIONS.

THE HERCULES MOTOR Co. has filed articles of incorporation with the Clerk of Union County, N. J. The company will be located at Westfield, and will engage in the manufacture and sale of apparatus for developing power. It is capitalized at \$25,000. The incorporators are: J. C. Warner, Newark; Charles G. Bliss, of Westfield, and M. I. Hester, of Brooklyn, N. Y.

WOOD GLEASON MOTOR CARRIAGE Co., Kittery, Me., organized for the purpose of manufacturing and dealing in motor carriages, with \$500,000 capital stock, of which nothing is paid in. The officers are: President, James E. McCoy, of Somerville; treasurer, F. E. Rowell. Certificate approved June 9.

VEHICLE STOCK INCREASED.

STOCKHOLDERS of the Electrical Vehicle Co., at a special meeting held in Jersey City June 20, unanimously voted to approve the recent recommendation of the directors to increase the capital stock of the company from \$12,000,000 to \$18,000,000. The increase will be divided equally among common and preferred shares. The object of the increase is to take over the Columbia & Electric Vehicle Co., of Hartford, Conn., and the New Haven Carriage Co. It is said that about one-half of the capital stock of the Columbia Co. is already owned by the Electric Vehicle Co., and that the control of the New Haven Carriage Co. is already owned by the Columbia.

TO CURTAIL FEES PAID TO PROMOTERS.

"PAYMENT to promoters of remuneration for their services is not made valid by a vote passed by the corporation when the corporation is in the sole control of the promoters before the capital has been issued to the public."

This decision was made on June 15 by the Massachusetts Supreme Court, in a case brought by the receiver of the East Tennessee Land Co., of which one of the promoters was Joseph R. Leeson, a State director of the Fitchburg Railroad.

The bills were brought by the plaintiff as receiver of the East Tennessee Land Co., an insolvent corporation, to recover from the defendants alleged secret profits made by them as promoters of that company. Promoters of corporations are held by the court to stand in a judiciary relation to future stockholders in the corporation and to owe them the duty of disclosing their remuneration as such promoters.

The court holds that: "It is a fraud for promoters to undertake to decide, for future stockholders in the corporation to be organized, that one-third of the whole capital stock of that corporation is a fair remuneration for their services as promoters, to issue one-third of the capital stock to themselves as such remuneration and then to invite the public to subscribe to the stock of the corporation without disclosing that fact to the subscribers and without getting their consent to the payment of that remuneration."

The promoters in this case voted themselves \$700,000.

THE ORGANIZATION OF THE SYRACUSE AUTOMOBILE CLUB.

THE organization of the Syracuse Automobile Club on June 16 was an example for the hundreds of similar clubs which will be organized in other cities as soon as the manufacturers of autos treat them as kindly as they have Syracuse. The "old home of the bicycle," Syracuse, is particularly blessed with beautiful streets, macadam and asphalt paved, and shaded by grand old elm trees,



SYRACUSE, N. Y. AUTOMOBILE CLUB.

which in many places completely arch them, making cool, smooth roads, which tempt one to indulge in the exhilaration of a swift spin in the open air.

The organization meeting was so ably handled, and the results desired so exactly obtained, that it will be interesting to give a full and detailed account of how it was done. Right at the start let us congratulate the Locomobile Co. in having in the person of C. Arthur Benjamin the acme of perfection of all that goes to make up what will some day be known as the "automobile man." Mr. Benjamin made the Syracuse Automobile Club, and he made it well. Even the clerk of the weather is a friend of the popular "Ben," and showed his indorsement of the plans by furnishing a perfect day. Mr. Benjamin talked the idea over with owners and prospective owners, his position in the Syracuse Automobile Co. putting him in close touch with both classes, and finally sent letters similar to the following to each one:

JUNE 6, 1900.

Mr. _____
Syracuse, N. Y.

DEAR SIR: Several owners of automobiles have talked with me regarding the organization of an automobile club in this city and vicinity. With this idea in view, I have been requested to send out a letter to owners of automobiles asking them to participate in an automobile run to Onondaga Valley, Saturday afternoon, June 16. It is thought advisable to make a start about 4:30 in the afternoon, and make a sort of parade through a few of the principal streets, ending up at the Valley about 6 o'clock and having dinner there, where arrangements will be made for a special dinner to be served for 50 cents a plate. At this dinner the plan for the organization can be talked over, and, if thought advisable, the club can then be formed.

Will you kindly advise the writer immediately as to whether you will take part in this run? The start will be made from the store of the Syracuse Automobile Co., at the corner of Water and Franklin streets, at 4:30 sharp.

Awaiting your reply, I remain,

Yours very truly,

The replies were very gratifying, and the attendance still more so. The following is the *Post-Standard's* account of the event, published the next day:

"The Syracuse Automobile Club was organized with nineteen charter members at Maple Bay yesterday afternoon. The owners of automobiles assembled at the store of the Syracuse Locomobile Co., at 4:30 o'clock, where photographs were taken by A. P. Yates, the New York Central photographer.

"After making a run through the principal streets, including South Salina, Onondaga, East Genesee, West Fayette and West

Genesee, the party started for Maple Bay by way of the boulevard with fifteen automobiles in line.

"The procession was headed by T. D. Wilkin, with his double automobile, in which were M. E. Sweet, E. B. Coggeshall, of THE HUB, of New York, and Harlow Clarke. The others in the party were: William Van Wagoner and Aaron B. Levi, J. W. Cronin and William Cronin, W. J. Frederick and R. D. Cooper, F. J. Wightman and F. E. Brower, W. H. Bex and W. F. Murphy, E. C. Stearns and F. Carey, Henry Trebert and Frank E. Norton, Graham K. Betts and James Moloughney, W. E. Fisher, of Sydney, Australia, and C. A. Benjamin, Dr. and Mrs. H. B. Hawley, M. Scott and Mr. English, Grove E. Warner and G. W. Peck. A. W. Letts and C. Wridgway, members of the Motor Car Club of London, England, with motor tricycles, were also present.

COURSE DINNER AT MAPLE BAY.

Arriving at Maple Bay, the party had a course dinner, after which the meeting was called to order. The objects of the meeting were set forth by C. A. Benjamin. E. C. Stearns was chosen chairman, and in his address said that the formation of an automobile club in Syracuse was an example of the city's progressiveness. He said that in his recent visit in Europe he noticed that automobiles were used more as a pastime than for their usefulness. This he attributed to the fact that Europe was far behind America in mechanical contrivances.

T. D. Wilkin was unanimously elected president of the club, and Grove E. Warner was chosen vice president. W. J. Frederick was elected secretary-treasurer. It was decided that the next meeting of the club would be held at Onondaga Valley, June 29, when a club run would be held.

LIST OF CHARTER MEMBERS.

"Those who signed the charter list were T. D. Wilkin, F. W. Gridley, C. A. Benjamin, F. C. Brower, G. E. Warner, William Van Wagoner, F. J. Wightman, W. J. Frederick, S. F. Stephens, A. R. Peck, E. C. Stearns, Frank E. Norton, H. L. Trebert, A. W. Letts, C. S. Wridgway, G. K. Betts, G. W. Peck, J. W. Cronin.

"Mr. Wilkin, as chairman, will appoint a committee of three members to confer with the officers and draft a constitution and by-laws. Before returning, Mr. Letts and Mr. Wridgway gave exhibitions of their speed with their motor tricycles on the Boulevard.

"The return of the club was made in fast time."

The photograph reproduced was taken by the Syracuse *Herald*, and shows the autos just after they had finished the round of the city and were about to start for the Valley.

Mr. Benjamin's plans not only proved a success in organizing the club, but the passing of fifteen or more automobiles through the principal streets of Syracuse *en masse* certainly showed the skeptics that the time for doubting the automobile had passed.

At the end of the dinner a short resolution was passed around for signatures, merely binding the undersigned to form a club, and as soon as the signatures were affixed Mr. E. C. Stearns, who did so much in perfecting the bicycle, was asked to act as chairman. The officers were elected and a time named for the next run.

AN AUTOMOBILE ASSOCIATION IN BERLIN.

AN association of automobile companies has been formed in Berlin. A large structure has been erected in the center of the city, which will contain a permanent exposition of automobiles of different makes, including private and racing vehicles, delivery wagons, motorcycles, and all the accessories of automobile construction. In this way the public will have an opportunity to inspect the different makes, and it is expected that this will considerably increase the trade. Besides the vehicles will be shown an extensive collection of plans, designs, models, etc. The project has been undertaken on the initiative of the Count of Talleyrand-Périgord, and the persons interested represent the leading financiers and industrial firms as well as prominent sportsmen.

TAXING MOTOR VEHICLES IN EUROPE.

MOTOR carriages and motor bicycles have already attracted the attention of European tax leviers, and in Antwerp these vehicles are doubly taxed, first by the province to the extent of fifty francs on motor carriages and twenty francs on motor bicycles, and second by a municipal tax of 100 francs on the former and fifty francs on the latter.

THE PHILADELPHIA RUN.

THE automobile run from New York City to Philadelphia, Pa., on June 2, did not meet the expectations of its projectors. The time made by the leading machine was longer than was expected, and had been beaten many times by public stages, private four-in-hand parties and bicyclists, but this could be explained by the bad condition of the roads and the heavy rain storm that overtook the riders and seriously interfered with the run in the latter half of the same. It was hoped that as this run was not a race, but an experimental trip, in which gasoline, steam and electricity would have an equal opportunity, that some satisfactory conclusion would be reached as to which method was the most desirable, but it ended as it began, each advocating his favored method. The first machine to break down was a gasoline motor, and the first to reach its destination was of the same class. The electric motors were able to show speed and power, but delays were occasioned by the necessary re-charging or shifting of batteries. Steam had its successes and its failures, so that nothing was settled as to the comparative value of the various systems. It is possible that, as a whole, none can claim superiority, but we regret that the results of this run should have left us no better informed than we were before.

THE "LOCOMOBILE" IN THE 1,000 MILE TRIP.

NEW YORK, June 16, 1900.

Editor of THE HUB:

DEAR SIR—We are advised by our agent, Mr. E. J. Halsey, 52 Sussex Place, South Kensington, London, of an interesting occurrence in the 1,000 mile trip held last month. As you probably know, one of our "Locomobiles" completed the 1,000 miles in a very satisfactory manner. The steepest hill encountered on the tour was Bunny Hill, just outside of Nottingham. The performances of the motor vehicles on this incline were carefully recorded and classified. Forty-eight vehicles competed in this trial, and were classified in nine groups, as follows:

First. Very good. The "Locomobile" Co. of America's steam carriage, two passengers.

Second. Nicely. Six horse power. Panhard.

Third. Steadily. Five horse power. Marshall.

Fourth. Well. Twenty-one vehicles.

Fifth. Easily. Eight horse power. Lanchester.

Sixth. Tacked up. Two vehicles.

Seventh. Shed passengers to ease or help push. Twelve vehicles.

Eighth. Stuck. Seven vehicles.

Ninth. Shed passengers and stuck. Three and a half horse power. Decauville.

This was a very interesting test, and reflects most satisfactorily on the skill of American manufacturers. Here is a case of a four horse power vehicle competing against forty-seven other machines running as high as twelve horse power, and as will be seen, it is at the head of the list, in a class by itself.

Very truly yours,

THE LOCOMOBILE CO. OF AMERICA.

COLLEGES TO FORM AN "AUTO" ASSOCIATION.

It is stated that automobile racing will be a college sport next year. Clubs have already been formed at Columbia, Yale, Harvard and the University of Pennsylvania. Delegates from these colleges will hold a meeting in October for the purpose of organizing an intercollegiate association and selecting a date and place to hold the first speed championships.

OHIO VEHICLE TAX.

THE Supreme Court of Ohio, in a decision made public on June 19, has declared the Haywood vehicle tax law invalid. While the case is not to be reported, Chief Justice Shauck on Tuesday evening authorized the statement that the court's ruling is based upon the ground that the passage of the bill in question was both special and class legislation.

The act, as certified to the secretary of state, sought to exempt from taxation upon their bicycles working men whose daily wages are not more than \$2. Furthermore, the act was made applicable only to the city of Columbus, whereas there are many decisions to the effect that statutes of such nature must be of general application. Judge Shauck said the verdict of the court was unanimous.

WILLIAM VAN WAGONER.

WILLIAM VAN WAGONER, whose portrait is published herewith, has been connected with the cycle trade for about fourteen years. He was connected with the agency department of the Pope Manufacturing Co. when those bicycles were first sold; was in the retail and jobbing business from 1886 to 1889, then went with the Eagle Bicycle Manufacturing Co. as master mechanic, and superintended the equipping of their first factory in Stamford, Conn., and two years later, their second factory at Torrington, Conn. He was then for a short time with the Liberty Co. as master mechanic, in their Rockaway, N. J., factory; when their works were removed, he went with the Warwick



WILLIAM VAN WAGONER.

Cycle Co., Springfield, Mass., and from there to Syracuse, N. Y., in 1894, as master mechanic of the E. C. Stearns Co. When the Barnes Cycle Co. was organized he was made general superintendent of their business, which position he held until the sale and transfer of the property to the American Bicycle Co., after which the majority of the stockholders of the Barnes Co. organized the Century Motor Vehicle Co.

To his efforts are due a large number of the improvements in bicycle construction, among them being the internal flush joint, the bi-plane socket, the interlocking direct spokes, the one-piece crank, the internal expanding seat post and handle bar post, etc. The experimental work of the automobiles has been carried on during the past two or three years by Mr. C. F. Saul and Mr. Van Wagoner, and the company are now building a neat appearing, serviceable vehicle, which should be seen to be appreciated.

They occupy the manufacturing building at 519 East Water street, which is a three-story brick building of slow-burning construction, and is equipped with all the modern appliances useful in the manufacture of motor vehicles. The company are prepared to fill orders on some of the vehicles in twenty days, and on others in from thirty to sixty days. Their illustrated catalogue, showing the different styles of their vehicles, is now ready for mailing.

BICYCLE NOT A CARRIAGE.

IN the case of Laurania Richardson *vs.* the town of Danvers, the defendant's exceptions are sustained by the full bench of the Supreme Court, which holds that a bicycle is not a carriage within the meaning of the terms of public statutes, Chapter 52, Section 1, which provides that highways and other ways named shall be kept in repair at the expense of the town, city or place where they are situated, "so that the same may be reasonably safe and convenient for travelers, with their horses, teams and carriages, at all seasons of the year."

AUTOMOBILE EXPOSITION AND TOURNAMENT.

BRANFORD DRIVING PARK, BRANFORD, CONN., WEDNESDAY AND THURSDAY, JULY 25-26, 1900.

BRANFORD DRIVING PARK is situated at Branford, Conn., eight miles from New Haven, and besides being one of the prettiest parks in New England, has one of the widest, safest and best banked half-mile tracks in the United States. A covered commodious building, 50 x 150 feet, for exhibiting and contesting vehicle owners is provided, also an additional covered building for the exhibition of motor vehicle parts and appliances. The long list of class races, special events and exhibition rides by the leading professional bicycle riders of the day has been provided for.

The list of events includes the following:

Class A.—Two wheeled vehicles, bicycles, tandems, etc. Five miles. Purse, \$225.

Class B.—Three wheeled vehicles, tricycles, etc. Five miles. Purse, \$150.

Class C.—Four wheeled vehicles, 500 pounds and under. Five miles. Purse, \$150.

Class D.—Four wheeled vehicles, 500 pounds and over. First prize, \$100 diamond studded solid gold medal. Second prize, \$60 solid gold die medal. Third prize, \$40 solid gold die medal.

Class E.—Obstacle race. Open to all styles of vehicles, excepting bicycles and tandems. Prize, \$50 solid gold die medal.

Class F.—Hill climbing. Open to all vehicles without pedal assistance. Prize, \$50 solid gold die medal.

Class G.—Brake test. Open to all vehicles to determine the brake efficiency. Prize, \$50 solid gold die medal.

Class H.—Grand championship, ten mile handicap. Open to first and second prize winners of all events, except Classes A, E, F and G. Prize, \$100 diamond studded solid gold emblematic medal.

Class I.—Grand parade, open to all styles of vehicles, for the best appearance, with silver cups to winners in all of the above classes. The idea of the management is to have the general exhibition each day, from 10 A. M. to 2 P. M., the parade at 2, and the races at 2:30 o'clock.

On Wednesday, July 25, first day, the heats of the different classes, a motor paced exhibition by Harry Caldwell (America's foremost middle distance rider) and the final of the grand bicycle and tandem \$225 race, with all of the leading professional bicycle racers as competitors.

Thursday, the second and final day, will see the continuation of the exhibition, and the handing over to the winners in the different classes their silver cups, after which the finals with the winners of the heats the previous day will be run, followed by an exhibition by Harry Caldwell, paced by his celebrated Henshaw and Hedstrom tandems.

The exposition and tournament will conclude with the grand international automobile championship ten mile handicap, in which will be found all of the first and second winners of the previous races, irrespective of size and weight of carriage. All manufacturers and owners of motor vehicles, tricycles and tandems are courteously invited to enter this exposition and tournament.

INCORPORATED.

THE St. Louis Automobile & Supply Co. has been incorporated under the laws of Missouri with a capital stock of \$10,000, all paid in. This was a consolidation of the well-known Automobile Supply Co. and the St. Louis Electric Automobile Co. Peter A. O'Neil, treasurer; B. C. Keeler, president; F. E. Bush, manager. Mr. A. L. Dyke, inventor and general expert, who built and designed all the vehicles for this company, and who originated the Automobile Supply Co., will be retained as superintendent. Quite a nice factory has been completed near the corner of Twenty-third and Locust streets. The company will continue to supply the trade with their high-class product in the way of running gears and gasoline engines of their own make. They will also continue to manufacture their improved electric runabout. The former Automobile Supply Co. have been in business for nearly a year, and were the first automobile supply company to start in any country. They have furnished material and assisted a number of first-class concerns to enter the automobile field. Peter A. O'Neil and Festus Wade, two very prominent business men of St. Louis, are among the directors.

Parties wishing anything in the automobile line will do well to write the company for their catalogue. Address the St. Louis Automobile & Supply Co., Twenty-third and Locust streets, St. Louis, Mo.

CREST INDESTRUCTIBLE SPARKING PLUG.

THE Crest Manufacturing Co., of Cambridgeport, Mass., manufacturers of Crest motors for automobiles, are putting on the market a radically new design of sparking plug, that is not affected by heat and expansion, and is consequently unbreakable. After a considerable expense in experimenting with the best porcelains of foreign manufacture, they have, through the assistance of a well-known chemist, discovered a new material that is unbreakable by heat or expansion. They have had these sparking plugs in use for a long time on their motors without any reports of failures, and have decided to introduce them to other manufacturers and users of other makes of motors. It is well known that the sparking plug is a delicate piece of mechanism, and gives considerable trouble, and the failure of motors can, as a rule, be traced to the failure of the sparking plugs, and for this reason all automobilists are compelled to



SPARKING PLUG.

carry one or two spare plugs in their kit. Although the jump spark method is the most largely used to-day, on account of the simplicity, it would be universally used in preference to the contact and wipe spark methods if it was not for the troubles of the sparking plug, with its liability to crack with the intense heat of the motor, short circuiting the secondary circuit. The material used in this plug is a perfect electrical non-conductor, and does not expand under intense heat. It is a tough material, not being brittle like porcelain. The plug, as shown in the cut, consists of a shell of steel, having a thread at one end to screw in the orifice of the chamber of the motor. The sparking plug proper consists of a slight cone of this new material, which is inserted in the steel plug. This cone fits tight in the shell, making a gas tight joint, without packing, unlike all other forms of sparking plugs, as they use packed joints, which in the hands of unskilled persons are apt to cause failure in the working of the motor. Through this cone a wire is passed, terminating at the bottom of the plug with an enlarged head. A platinum wire is inserted in the points. These plugs are sold singly or in lots of twenty-five to 100 to the trade. Directions go with each plug.

CUT GEARS FOR AUTOMOBILES.

THE R. D. Nuttall Co., of Pittsburg, Pa., are now prepared to build all kinds of cut gears for automobiles. They were until a few months ago located in Allegheny, Pa., but business outgrew their factory and compelled them to secure greater room. They now occupy the large building on Garrison street formerly used by the Westinghouse Electric & Manufacturing Co. They have been specialists in gear cutting for many years, are one of the largest in the world, and have a plant with facilities unequalled. The plant is run by electric power throughout, six large motors being used to distribute the power. They have long desired to build automobile gears, but not until now have they had the room to equip with the special machinery required for doing the work properly. The high reputation of this firm and international sale of its product are sufficient guarantee to automobile manufacturers that whatever is made by them is of the highest quality.

Items of Interest.

REDUCED RATES TO NEW YORK.

THE Merchants' Association has received word from Chicago that the lines forming the Central Passenger Association have granted the application of the Merchants' Association for reduced rates from Central Passenger Association territory to New York for the fall buying season. The Central Passenger Association covers the territory west from Buffalo, N. Y., and Pittsburg, Pa., to the Mississippi River, including Chicago, and Chicago south to the Ohio River, but including Northern Kentucky and north into Canada.

The dates for which the reduced rates are granted are August 4 to 8 inclusive, and August 25 to 29 inclusive. The rate of fare will be one fare and one-third for the round trip; the return limit on each ticket will be thirty days from date of sale. The general terms and conditions will be the same as those heretofore governing similar concessions.

The Trunk Line Association has already granted the rates from its territory. The latter includes the section of the country lying east of Buffalo, N. Y., Pittsburg, Pa., Wheeling, W. Va., to the New England boundary, and south to the line of the Ohio and Potomac Rivers, including Baltimore and Washington. The dates from Trunk Line territory are August 25 to 28 inclusive, and September 1 to 4 inclusive.

The application which the Merchants' Association made to the lines of the New England Passenger Association has been denied. The Merchants' Association also made application to the roads in the South covering the territory east of the Mississippi River and south of the Ohio River. That application has also been denied.

An application is now before the lines in the Southwest forming the Southwestern Passenger Bureau. These lines include the great State of Texas. Action could not be taken in that far away territory until after the roads in the intervening territory had decided what course they would pursue. Now that the Central Passenger and Trunk Line Associations have granted the rates, the application in the Southwest will be pushed at once. The Merchants' Association has telegraphed to the chairman of the Southwestern Passenger Association asking to be heard in this matter. If necessary, the association will send William R. Corwine to St. Louis to advocate the granting of these reduced rates from Texas.

"We will prepare our circulars at once," said an officer of the Merchants' Association, "announcing the reduced rates as soon as we hear from St. Louis about the Texas rates. We will send the circulars to every merchant in the territory in which the rates will be in effect and to the territory contiguous thereto, telling every merchant how he can avail himself of a special rate to this market to buy his goods for the fall season. We will also send out a circular setting forth the benefits of the New York market.

"Our advices from throughout the country are that the election this year will not retard buying as it has done in National campaigns heretofore. Still, we will make doubly sure of this by using every effort that can be thought of to induce merchants to come to town.

"Each year that we have had these rates we have induced a greater number of merchants to come to this market than had come in previous years. In this way we have beaten our own record, which we want to beat again."

"CHERRY HEAT" WELDING COMPOUND.

ONE would think that the general depression acknowledged to exist in the iron and steel trade would extend to all closely allied branches of business, but it does not seem to apply to the business of the Welding Compound Co., of Paterson, N. J., who report sales for the first half of June to be equal to sales of the entire month of June, 1899. They are reaping some of the penalties as well as benefits of success, and do not object to fair competition, but when other parties try to take advantage of their hard but fairly earned world-wide reputation, by selling other and inferior compounds as "Cherry Heat," they protest, as will be seen under their "Caution" advertisement on page 68 of this number, which we advise our subscribers to read carefully. A visit to the factory of this company, Nos. 152-156 Putnam street, shows it to be a model of convenience for economical manufacture. Situated on a switch of the N. Y., S. & W. R. R., their materials, all of which, even packing boxes in shooks, are bought in

carload lots, are delivered right at their door. On delivery they are placed at once on a steam elevator of two tons' capacity and taken to the upper floors, and thence delivered through shutters to points where needed, insuring a maximum of capacity with a minimum of labor. Although this company built a large addition to its factory a year ago, adding 50 per cent. of floor space, materials are now on hand for another addition or wing, which when finished, will contain a complete smith's forge to carry on experiments and tests which are constantly being made, so as to improve the Compound if possible, while another portion of it will be used for the assembling and storage of packing boxes. The company always carries a full stock of Compound, and is thus able to fill all orders as soon as received. Samples will be sent free of charge on request, and our readers should give "Cherry Heat" a trial.

F. O. BAILEY & CO.'S NEW PLANT.

WHEN the plant of F. O. Bailey & Co., of Portland, was burned out, few thought that a new building would be erected and be occupied in the short period of four months, notwithstanding the well known energy of the company; but the building is completed, and is stocked with the company's work and a large line of popular vehicles by other builders, together with harness, robes, etc. The building is 35 feet on Middle street and 110 on Market street. The store is lighted by 108 windows, and 140 incandescent lights will be used to furnish artificial light wherever this is found to be necessary. There is a complete system of private telephones connecting all of



NEW BUILDING OF F. O. BAILEY & CO.

the various floors, departments, office, etc. The basement front is finished in North Carolina pine, fitted with display racks, counters, tables, etc., for the display of outfits. A harness room displaying 125 different harnesses is in the rear of the outfit room. This room is lighted with electric lights, finished in Norway pine, with a polished maple floor. In the rear of the harness is the wholesale department, where goods are packed and shipped. The first floor is used exclusively for carriages, and will contain carriages manufactured by this firm and a few choice styles from other builders, of the best quality. The second floor contains the offices, the balance being used for the display of carriages arranged particularly for the wholesale department. The third floor front is for the harness making department. The balance of this floor is used for the display of carriages of the medium grade and second hand. The fourth floor is for express, laundry and all kinds of heavy wagons. On the fifth floor is a general assortment of carriages not accommodated on the other floors.

THE AUBURN WAGON.

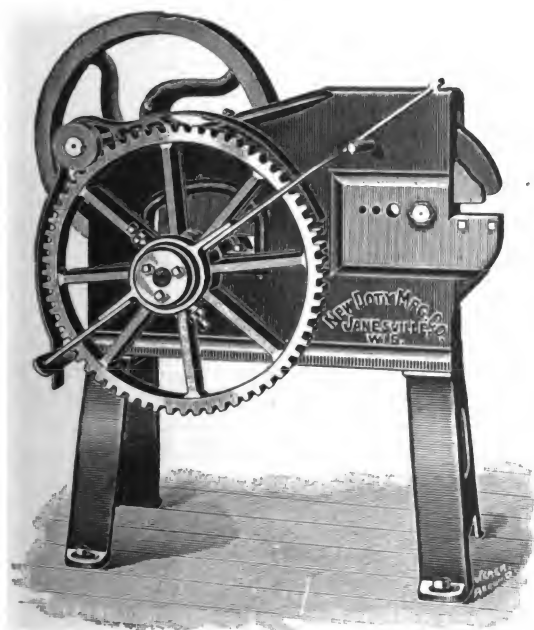
If you are not fully posted in regard to the merits of the Auburn wagon and want to include it in your stock as a sure seller, write to the Auburn Wagon Works, Martinsburg, W. Va., for their illustrated catalogue and other information.

BALLANTINE & VAN FLEET.

ONE of the most attractive repositories that we have visited of late is that of Ballantine & Van Fleet, of Somerville, N. J. The building is located on a corner, the front on Main street. It is three stories high, of brick, and pleasing architecture. The office is on the ground floor, the upper floors being well stocked with popular styles of vehicles, harness, etc. The surrey room is 50 by 160 feet, the buggy room 50 by 160 feet, the rockaway room 50 by 80 feet, with a sleigh room in the rear 40 by 60 feet. A wagon and buggy room occupies the third floor, which is 100 by 160. The harness room is 50 by 80 feet. The company's trade calls for a high grade of work, of which they carry a thoroughly representative stock. Everything around the building evidences thrift and a careful attention. The season's trade has been good, and now in mid-summer, although trade is light, yet there is sufficient doing to keep the force well employed.

POWER SHEARS FOR BAR IRON.

THE accompanying engraving represents a shearing machine, built in six sizes, by the New Doty Manufacturing Co., Janesville, Wis. They are made especially for cutting bar iron—round and flat—the smallest machine weighing 600 pounds, capable of cutting 1 in. round iron and 3 x 1/2 in. flat iron. The largest, weighing 10,000 pounds, is capable of cutting 3 in. round iron and 6 x 2 in. flat iron. As will be



NEW DOTY POWER SHEARS.

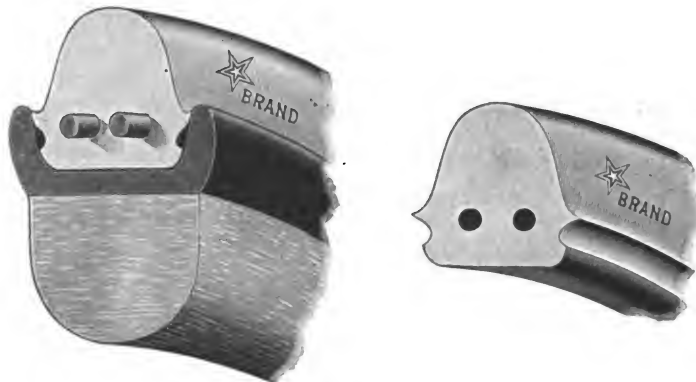
seen, the machine consists essentially of a shear lever moved by a cam which is on a shaft passing through under the lever. This shaft is driven by suitable gear wheels from a second shaft, which carries the fly-wheel, the clutch, and driving pulley. The blades for cutting flat bars and those for round iron are on opposite sides of the lever fulcrum, both being always in place and ready for use. The knives for round iron are the reverse of the bar, and do not flatten it in cutting, but leave the ends round. The gearing is proportioned 10 to 1, and all parts are made amply strong to resist the greatest strain which can be brought upon them.

TO MAKE ARMENIAN CEMENT.

PUT five or six bits of isinglass in water till softened, remove from water and dissolve in rum, and add two liquid ounces of strong glue. Then add two small pieces of gum ammoniacum, which must be rubbed till dissolved. In a separate vessel dissolve five or six bits of gum mastic, each the size of a large pea, in as much spirits of wine as will melt it. Mix the two liquids together, with sufficient heat to melt both. Keep in a well-stoppered bottle, and, when required for use, set the bottle in boiling water till the mixture melts. This cement will unite anything, even glass to polished steel.

THE STAR BRAND RUBBER TIRE.

THE Batavia Rubber Tire Co., of Batavia, N. Y., are manufacturers of the Star Brand rubber tire, one of the latest rubber tires put upon the market. This tire has special features, to which attention is

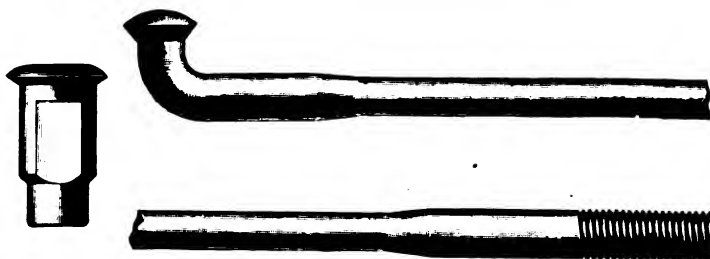


STAR BRAND RUBBER TIRE.

called, and for which much is claimed. We think it well for carriage and other vehicle manufacturers who are interested in rubber tires to write the company and learn fully regarding this candidate for public favor. The company use nothing but the best material in the construction, and there is no restriction as to size. See their advertisement on another page.

SPOKES, NIPPLES AND AXLES.

THE Wire Goods Co., of Worcester, Mass., call the special attention of manufacturers of wire wheels for speed wagons and other carriages, also the builders of automobiles, to their line of spokes,



WIRE SPOKES AND NIPPLES.

nipples, etc. The company manufacture wire goods of every kind, and are experts in their line. The buyer, therefore, of wire spokes, etc., who uses their goods, deals with a house that fully understands the secret of sizes and strength, and takes no individual risk. We recommend a correspondence with the company.

SANITARY APPLIANCES.

THE United States Sanitary Co., makers of odorless steel sanitary dump carts and wagons, Washington, D. C., have introduced a number of appliances, among them the Edson diaphragm pump and the Witt corrugated can. The diaphragm pump for emptying cesspools is made for 3 inch suction and discharge hose, has side inlet and outlet, large hand hole for cleaning, weighs 270 pounds, occupies a space 15 x 15 x 42 inches high, and is capable of handling 3,500 gallons of water or semi-fluid material through 25 feet of suction and through up to 200 feet of discharge hose with the labor of but two men. It is supplied with operating handles and also odorless cap if desired, is made in the best manner of the best materials, and is warranted to do its work rapidly and well. The refuse can is of heavy corrugated galvanized steel; at top and bottom heavy bands are riveted on, extending clear around and reinforced at jointure. Lids and bottoms are each stamped out of one heavy piece of steel and are concave and convex; edges of lid fit closely around the top of can. Lids fit so there is no projection, so water cannot get in or odor get out.

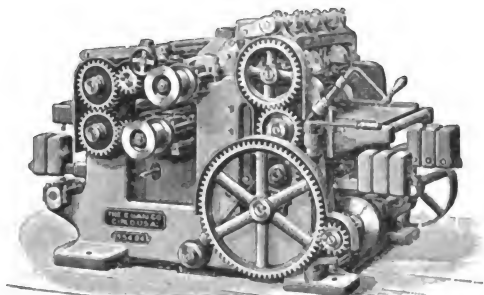
NAMES alone mock destruction; they survive the doom of all creation.—*Trevanion.*

DESTRUCTION BY FIRE OF WHEEL PLANT.

MESSRS. CRANE & McMAHON, manufacturers of wheels, carriage woodstock and hardwood lumber, have met with the loss of their factory at Richmond, Va., by fire. This was a large plant at the lower edge of the city, two miles from the court house. The plant and yard room covered about nine acres of ground. The loss is considerably over \$200,000; insured for \$171,500. They intend to rebuild on a larger scale than heretofore. In the meantime they have a great deal of raw material at various points and are already running two small plants, which enable them to keep their patrons supplied with stock until the new factory is built.

DOUBLE CYLINDER SURFACER.

We illustrate a new machine just placed on the market by the Egan Co., of Nos. 421 to 441 West Front street, Cincinnati, O., and patented December 19, 1899. It is their new No. 18 double cylinder surfacer. This new machine, designed for general use, possesses the following advantages: First: It has broken rolls and broken pressure bar, and each section is center-gearred and works independently and is very powerful. Second: The lower head comes immediately after



NO. 18 DOUBLE CYLINDER SURFACE PLANER.

the upper. Third: The lower head can be drawn out on side of frame for convenience in sharpening, and pressure bar comes with it. Fourth: It is a self-contained machine, with feed inside, and can be made to feed faster, slower or stopped, all with the same lever. This machine, which is new and strictly first class, is made in three sizes, to plane 24, 27 and 30 inches wide and 8 inches thick, and for carriage and wagon shops, box factories and wherever hardwood is used it is unexcelled, and the manufacturers pledge their reputation that it will meet the requirements of the best users, and they will be pleased to furnish further particulars to intending buyers.

OFF FOR EUROPE.

C. F. KIMBALL, of C. P. Kimball & Co., Chicago, will sail from New York for Europe on July 11. He will spend a week in London and one or two weeks in Paris, and will then take a trip through the Austrian Tyrol and see the Passion Play at Oberammergau.

SOUTH AFRICAN TRADE OPENINGS.

"DURING the past ten years the commerce of South Africa has been steadily on the increase," writes Consul Winter from Annaberg. "Official statistics show that Germany has participated largely in the gain. In 1891, Germany exported to the Transvaal products amounting in value to \$295,080; in 1894, to \$1,318,520; in 1896, to \$3,258,220; in 1898, to \$2,177,320. The exports to British South Africa and the Orange Free State amounted in 1891 to \$1,283,780; in 1894, they were \$2,001,260; in 1896, \$3,924,700; in 1898, \$3,546,200, or almost three times those of 1891. German imports from South Africa amounted in 1891 to \$4,119,780; in 1898, to \$4,858,060, consisting chiefly of Cape wool. German manufacturers are preparing to make the most of the renewed commercial activity which is expected to follow the war.

"Our manufacturers should keep a wideawake eye on this part of the world. No nation is so well equipped as we are to supply South Africa with the very best weapons with which to work out her industrial and commercial destiny. All we have to do is to adapt ourselves to the requirements of the people, and a very large share of the foreign trade will fall into our hands."—*New York Sun*.

NEW ENGLAND SOCKET CO.

THIS company make a line of popular whip sockets. They are wholesale manufacturers of whip sockets, also dash rail, corner irons, carriage and sleigh mountings, name plates, etc. The durable and elegant finish of their goods is well known to the trade. They aim to head the procession in whip sockets, etc., this new century, in style, quantity, finish and prices. They can promise lowest prices and prompt service, as they manufacture all their goods from beginning to end, in their own factory. They make the enamel that the goods are finished with, and their facilities for the production of whip sockets are not surpassed in this country. The cut herewith represents a cheap sleigh whip socket, but one that is strong and well finished. It is strongly made, of best quality sheet iron, and japanned in the best possible manner. The fasteners are so placed that the socket can be secured to dash and goose neck.



No. 14

The price is very low. This is only one of a number of whip sockets they make, suitable for sleighs. See advertisement on another page.

QUICK WORK.

THE large three-story finishing shop of the Columbus (Ohio) Bolt Works, in which were employed about 300 men, burned on April 3. Within ten days they had much of their machinery running in temporary quarters, with electric power supplied from sources outside of their own power plant. Within two months their machinery was replaced and running as usual. The fire gave them the opportunity to re-arrange and supplant with improved facilities, making to-day one of the most up-to-date institutions in their line in the country.

FRAMINGHAM'S BI-CENTENNIAL.

At the recent bi-centennial of the town of Framingham, Mass., the various industries of the town were represented on floats. Among them was the float of A. M. Eames & Co., South Framingham, manufacturers of wheels, which was one of the most striking features of the parade. It was a chariot standing 16 feet high and made up of a melange of wooden wheels and wheel materials of



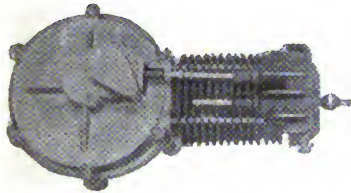
A. M. AMES' FLOAT AT THE FRAMINGHAM BI-CENTENNIAL.

all kinds and ages. The most modern were the rubber tired. The supporting wheels were 12 feet in circumference; side lines were a circle of much larger arc; seat was supported by a brace of wheel rims. The whole was a product of Mr. Eames' factory, and the design of his own origin. It was drawn by six horses driven by Mr. McNichols.

Our own heart, and not other men's opinion of us, forms our true honor.—*Schiller*.

GASOLINE MOTORS.

THE illustration herewith shows a new flange cooled motor, for use on bicycles, which has recently been brought out by the Lowell Model Co., of Lowell, Mass. This motor is 13 in. high, weighs 25 lbs., and is of ample capacity to develop one horse power at 1,000 revolutions per minute. In construction of this motor several improvements have been introduced: A solid steel crank shaft is used, which obviates the difficulties due to loosening of parts, which is liable to occur with cranks built of several pieces bolted together. The crank cases are of aluminum, bearings of bronze, gears are cut,

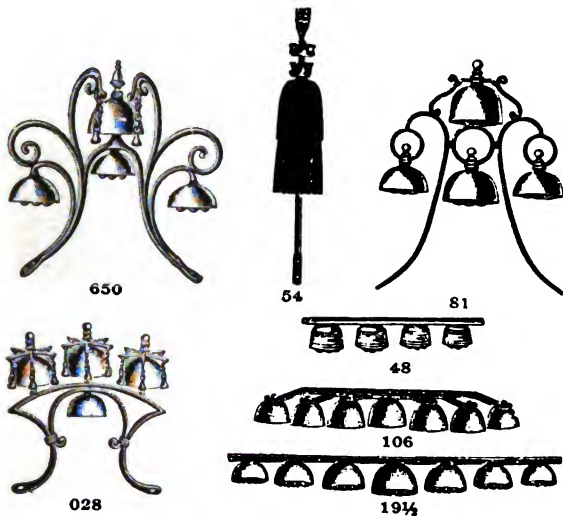


ONE HORSE POWER MOTOR.

and construction thorough. For ignition, the jump spark method is employed, as being more reliable for high speed attained in these motors than either the contact or wipe sparks, also, as it allows regulation of speed by variation of time of ignition, which method is in favor for vehicle motors. Motor may be attached to frame, over the rear wheel, or placed in frame and held in place by braces. A friction disc may be used, or, if preferred, a large sprocket can be placed on rear hub and driven with chain. Either method can be used in connection with a coaster brake, allowing use of pedals in starting, and resting feet upon them while running with motor. The motors are furnished complete, or the castings and full size blue prints may be obtained by those who prefer to construct the motors for their own use. This company also furnish castings, with working drawings, and finished motors of several sizes for vehicles, launches, and stationary purposes.

SLEIGH BELLS, PLUMES, ETC.

You will soon be wanting sleigh outfits, and it is none too early to look up stock. When thinking of doing so, place the name of the Chapman Manufacturing Co., Meriden, Conn., on your list, and be



BELLS AND CHIMES.

sure to write them. You may sometimes want plumes and bells for business and other wagons. The Chapman Co. can furnish you with anything of the kind. Send for a catalogue and get styles and prices.

THE GOODYEAR BOSTON BRANCH.

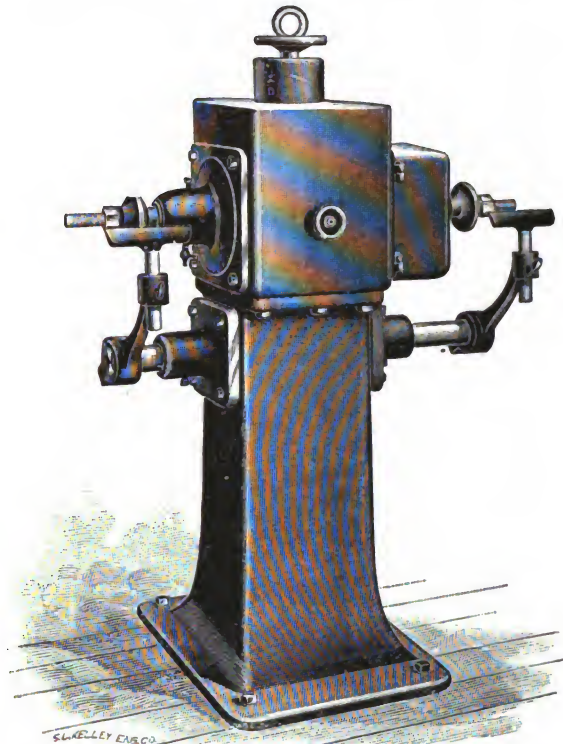
THE Goodyear Tire & Rubber Co., Akron, O., have opened a branch office at No. 16 Beverly street, Boston, Mass., and have placed their eastern matters in the hands of F. W. Suhr, who is well versed in the rubber tire business, having followed it successfully for several years. Mr. Suhr will handle both the Goodyear carriage and bicycle tires, and he has already opened up a most promising business.

A CINCINNATI PARTY WINS A PATENT SUIT.

THE Seinsheimer Paper Co., Cincinnati, O., recently brought suit against the Hanchett Paper Co., of Chicago, Ill., for infringement of patent for shipping wrappers for vehicles. The case was heard before His Honor Judge Kohlsaat, in the United States Circuit Court at Chicago, and all possible defenses against the patent were presented and argued. The court decided in favor of the plaintiff, the Seinsheimer Paper Co.

MULTI-SPEED ELECTRIC MOTOR.

THE cut herewith not only illustrates the special fitness of the multi-speed electric motor, manufactured by the Stow Manufacturing Co., of Binghamton, N. Y., for direct connection, but also one of the most practical and economical emery grinders on the market. The machine will drive two 2 x 14 inch emery wheels at any speed between 960 and 1,600 revolutions. Starting at the proper speed for these wheels, as they wear away it can be correspondingly increased, so that the proper peripheral speed can always be maintained, allowing the emery wheels to always cut to the best advantage. There are no belts to burn or break in starting. It can be placed in a situation most convenient to its work, without regard to line or countershaft. If desired, it can be moved from time to



MULTI-SPEED ELECTRIC EMERY GRINDER.

time, with no expense of shifting countershafts or adjustment to line shaft. Simply connect with power current and the tool is ready for work. These are but a few of the many advantages of this grinder which suggest themselves. Prices and other information desired furnished on application.

THE PARIS EXPOSITION.

MR. THOMAS P. EGAN, president of J. A. Fay & Egan Co., the large manufacturers of wood working machinery, of Cincinnati, O., left on June 9 for Paris, sailing from New York on the American liner "St. Louis." This well-known firm is making a most elaborate display at Paris, and although the Exposition can hardly be said to have fairly opened, yet the success already achieved and the praise and encomiums bestowed upon them for their enterprise and the completeness of their exhibit have been most gratifying. Their stands, in Groups IV. and V., United States Section, both at Champ de Mars and Vincennes Annex, consist of about 3,000 square feet, and are located in a most advantageous position for illustrating what the complete line of wood working machines will accomplish, as they are all in operation. Mr. Egan goes to look after the interests of his firm, remaining abroad about three months, and during his visit he will be pleased to place his knowledge of and experience in wood working machinery at the service of visitors to the Exposition who may be interested.

SPEED WAGONS.

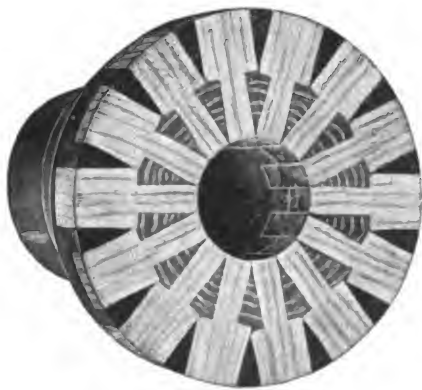
WITH the ever changing conditions of things, and with new problems arising for solution, the work of the carriage builder has been one of unceasing toil. With the great revival of interest in the trotter and pacer, and the building of the modern speedways throughout the country there arose the necessity of a vehicle peculiarly adapted to these new conditions and to meet the demands of the gentleman driver. To these new conditions of things is due the modern speed wagon, which without a doubt represents one of the highest achievements in vehicle building. Light, yet strong, rigid in construction and artistic in design, capable of sustaining an enormous weight in proportion to its own, it is the acme of perfection and is great in its simplicity. To the Werner speed wagon it has remained to fulfill all these conditions and to satisfy the exacting demands of the most fastidious drivers. Constructed of the very best materials, with an original and absolutely safe fifth wheel, bearings that are made and run like a watch, and with the simple and effective manner in which the wheel spindles are supported, it has proved to be a perfect speed wagon. Dealers should write for catalogue and particulars of the Werner speed wagon. Made and guaranteed by George Werner, Buffalo, N. Y.

NEAT POCKET MEMORANDUMS.

THE Dalzell Axle Co., of South Egremont, Mass., send out in the way of souvenirs a convenient little memorandum, neatly bound, and of fine paper, gilt edged. Like the company's axles, these books evidence care and attention to minor details, features that have made the Dalzell axles popular and reliable.

"CLARK" WHEEL.

THE Clark wheel is a new candidate for public favor. It has a shell hub of peculiar construction, which gives the hub the appearance of the regular wood hub. The cut of a bisected hub shows the wood center, the central iron rim and the spokes in position. As



CROSS SECTION "CLARK WHEEL."

will be seen, the spokes are held securely, and there is no shoulder near enough the outer surface of the hub to break. Wheel makers can purchase the shells and make up their own wheels. The inventor is an old, practical wheel maker. He has given much attention to the matter of hubs, and the "Clark" is the result of many years of study. For further information, address Frank W. M. Clark, manager, Waterloo, N. Y.

BIKE WAGONS.

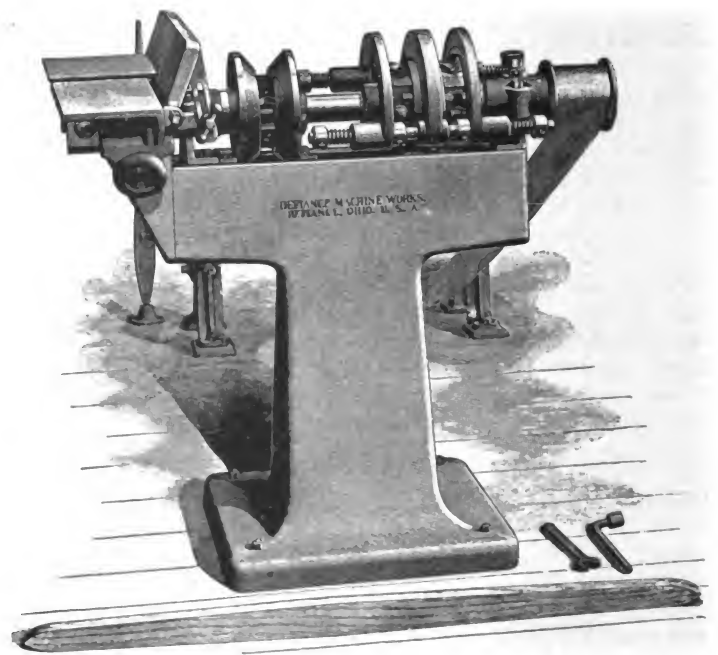
WRITE to the La Porte Carriage Co., La Porte, Ind., for a string of their illustrations of bike wagons in colors. This string of cards is a good thing to have around, when you are selling, or trying to, bike wagons of high grade.

WILL MANUFACTURE AUTOMOBILES.

THE Slaymaker-Barry Co., Connellsville, Pa., have sold out their entire lock business, and will hereafter devote their entire factory to the manufacture of automobiles. The firm name has been changed to the Baldwin Automobile Manufacturing Co.

NO 3 PATENT HORIZONTAL SHAPING, PLANING AND CORNERING MACHINE.

THIS engraving represents the No. 3 patent horizontal shaping, planing and cornering machine manufactured by the Defiance Machine Works, Defiance, O., which has been designed for shaping irregular forms to pattern, as well as for planing flat surfaces and rounding, chamfering and cornering. It is a combination of three machines in one. It covers a large variety of work required in wagon, carriage, agricultural implement, shaft, pole, singletree, gear, sleigh, felloe and general wood working factories. The frame is a substantial casting in one piece, with cored center, and a broad floor base to stand firm. The cutterhead spindle, of steel, 15-16 inches in diameter, runs in long, self-lubricating bearings with the driving pulley at the end. The two shaping heads are each equipped with four knives, and provided with an ingenious system of guides for shaping the work to pattern. They are turned true and bored out on the inside, so that the knives can be set close up to the work. The center guide between the heads is stationary; it is fitted with a collar on each side upon which the pattern rides, and the material to be shaped is held true and in proper position by the outside



HORIZONTAL SHAPING AND CORNERING MACHINE.

guides, which are brought to bear against the sides of the material by a soft spring tension. Sufficient adjustment can be secured to the side guides for narrow or wide work. By the use of the two shaping heads and the double guides, the work to be shaped, when cross grained, can be reversed and handled from one head to the other, similar to the use of a double spindle upright shaping machine. The rounding and cornering heads are surrounded with guides having a horizontal adjustment to regulate the depth of cut and width of work. The cutters in these heads can be used with straight or circular cutting edges, different in widths, to suit the class of the work expected of them. The 6 inch planer head carries three knives, and it is supplied on each side with an adjustable iron table, which is planed true and provided with a vertical adjustment by hand wheel and screw to set them up or down to regulate the depth of cut. It will shape, plane, round and chamfer either hard or soft wood, and do it rapidly and smoothly, and it is the most convenient and useful machine that can be employed in a wood working factory.

THE CINCINNATI CARRIAGE EXHIBIT.

WE learn from the management of the Vehicle, Harness and Implement Exhibit to be held during the week beginning November 19, at Cincinnati, O., that although a protest circular was issued to the trade by twenty-eight Cincinnati manufacturers, their plans are going ahead successfully, and nearly all the available space has been sold. The exhibition will be held in connection with the convention of the Tri-State Vehicle and Implement Association, and it is under the active management of Monte L. Green, Editor of *The Spokesman*.

THE MILLCREEK WAGON CO.

THE MILLCREEK WAGON CO., of Cincinnati, O., manufacture a full line of carriage and buggy bodies of latest and standard designs, made up in the best manner. The president of the firm, Mr. A. L. Knoblauch, was the first to apply machinery for carriage wood work,



PLANT OF THE MILLCREEK WAGON CO.

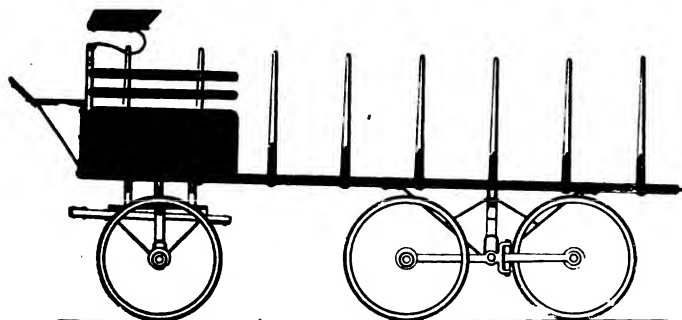
twenty-five years ago. Their building is one of the best equipped for carriage wood work in the State. The mill room and smith department have been fitted out with the latest improved machinery, and the entire plant is lighted with electricity. The dry room has capacity for 70,000 feet of lumber. The entire floor space is 54,000 square feet, capacity for 100,000 jobs per day.

THE OIL FIELDS OF CALIFORNIA.

VAST amounts of money have been made by investors in oil territory, and this has been especially so of late in the California district. The Santa Maria Oil Co., of San Francisco, owners of a large tract of land in the heart of the oil belt, have decided to sell 10,000 shares of their stock in order to open more wells and purchase more property. They offer this stock at fifty cents a share for a limited time. Particulars may be obtained of E. C. Baldwin, financial agent, 69 State street, Albany, N. Y. Their references are any bank in San Francisco and the leading newspapers.

AN IMPROVED UNDER GEAR FOR WAGONS, ETC.

JAMES BUCHANAN, of Brooklyn, N. Y., has recently patented a new and novel device for under gears of wagons, by which draft is reduced when overcoming obstacles on the road. The illustration



THE BUCHANAN DOUBLE WHEEL.

shows the new feature, in which two wheels are supported at each end of the axle. The inventor has fully described his invention in his advertisement on another page, and we recommend all to read it carefully.

EASTMAN AUTOMOBILE CO.

THE Eastman stanhope, manufactured by the Eastman Automobile Co., of Cleveland, O., is arranged for electric or steam power. The body is of steel and the enamel is baked on. The motive power, if steam, is furnished by a two cylinder upright engine, marine type, three and one-half inch stroke, five horse power. The fuel supply to the burner is automatically regulated by pressure diaphragm. Fuel and water supply can be carried for a continuous trip of sixty to seventy-five miles. The steering device operates the forks which hold the front wheels. The weight, with steam equipment, is about 800 pounds.

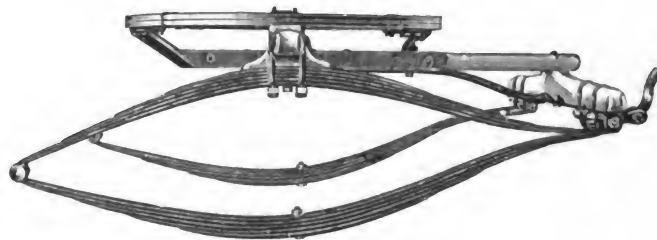
THE LONG BRANCH HORSE SHOW.

THE sixth annual show of the Monmouth Horse Show Association will be held on July 26, 27 and 28, inclusive, at Hollywood Park, Long Branch, and will undoubtedly maintain its popularity as one of the best of the out-of-door shows.

Held at the season when Long Branch—Hollywood in particular—is the most frequented by the fashionable set who visit the New Jersey coast, there is always a large and representative collection of animals, the valuable property of the visitors, who are ready to show them in harness or under saddle. This adds much to the success of the show, financially and socially. The evening show for Saturday, July 29, is intended as one of the most enjoyable features. Entries close July 16, 1900. Over \$4,000 is to be distributed in prizes. Fuller details may be obtained from P. J. Casey, secretary and treasurer, P. O. Box No. 5, West End, Monmouth County, New Jersey. A satisfactory number of entries are already reported, and there appears to be no doubt that the show this season will surpass that of its predecessors.

THE HOLMAN PLATFORM GEAR.

THE Tuthill Spring Co., of Chicago, Ill., are manufacturers of the Holman gear, one pattern of which is illustrated herewith. The splinter bar of this gear has a steel plate over the bottom which makes a truss brace and stiffens the bar. The spring bar



DROP POLE OR SHAFT GEAR.

or circle bar, upon which the circle rests, is also supported by a truss brace extending from one spring to the other. The fifth wheel is thoroughly bolted to wrought iron forgings with ten bolts of best quality.

EXPIRED PATENTS.

THE following list of recently expired and issued patents is furnished by Messrs. Davis & Davis, successors to Alexander & Davis, solicitors of patents, Washington, D. C. A copy of any one of these may be had for 10 cents by sending to the above firm.

EXPIRED APRIL 24, 1900.

- 276,194—Carriage Axle—Charles S. Harper, Sharon, Mass.
- 276,196—Thill for Vehicles—D. P. Sharp, Ithaca, N. Y.
- 275,213—Spring-brace for Vehicles—S. R. Bergen, Cantril, Ia.
- 276,288—Carriage Top—L. Schmetzer, Bavaria, Germany.
- 276,309—Two-wheeled Vehicle—Charles Trerwilder and Theodor Bast, Hennepin, Ill.
- 276,500—Two-wheeled Vehicle—Clarence H. Straight, Bryan, O.

Description of Latest Styles.

(Continued from page 150.)

SPEED WAGONS.

(See "Latest Styles.")

PLATE LV. illustrates the Payne speed wagon, constructed for track and road work by the Payne Sulky Co., Troy N. Y., and which is claimed to be the fastest speed wagon on the market, as it is built similar to the Payne sulky. The construction of this wagon is such that when the driver steps into the wagon his weight is back from the center of the axles, and therefore the draught is reduced to a minimum, making it the fastest wagon built. These wagons are finished and trimmed handsomely, and present a very neat appearance on the road.

PHAETON ON BIKE GEAR.

(See "Latest Styles.")

PLATE LVI. illustrates a phaeton on bike gear, built by the Sturtevant-Larrabee Co., of Binghamton, N. Y. As will be seen, the entire outfit, as shown, gives the appearance of comfort, and is a typical representative of a class of the most comfortable American carriage.

Trade News.

BY UNCLE SAM.

ALABAMA.

HUNTSVILLE—Thomas W. Smith and James M. Greene have formed a partnership for the building and operation of a first-class carriage factory in this city. They will manufacture all kinds of wheeled vehicles and will employ twenty men. The machinery has been ordered, and the factory will be in operation by the middle of July. The firm have awarded a contract to J. N. D. Brown for the erection of a frame building 140 x 75 feet, and the work of construction will begin at once. The plant will represent an investment of \$15,000 to \$20,000. Both of the proprietors are experienced carriage makers, Mr. Smith having been associated with J. W. Skinner & Son for many years. Mr. Greene came from Barnesville, Ga., and has been employed with the Skinner factory for about a year past.

Anderson & McCoy, harness and buggy dealers, made an assignment June 23, naming Robert E. Murphy as assignee. The liabilities are only \$400, and are more than covered by the assets of the firm.

J. W. Skinner's carriage factory and repository on Green street will soon be completed. It will be two stories high, and will be fitted up with modern machinery.

ARKANSAS.

PARAGOULD—The hub and spoke factory has been shut down temporarily on account of scarcity of material.

CONNECTICUT.

NEW HAVEN—Harry L. Sterrett, formerly of Cincinnati, O., but now a resident of this city, has filed a petition in bankruptcy. Mr. Sterrett is a son-in-law of W. J. Atwater, with whom he is associated in business at the present time. The petitioner was engaged in the manufacture of carriages and wagons in Cincinnati, and the partnership became involved in financial difficulties in 1898. They went through the Insolvency Court in Cincinnati at that time, and now Mr. Sterrett seeks to take advantage of the immunity granted by the present bankruptcy laws. His schedule filed shows liabilities of \$25,441.70 and no assets. The petition has been referred to Referee Newton.

FLORIDA.

JACKSONVILLE—The Ocala hardware, spoke and rim factory is operating here.

GEORGIA.

SPARTA—The machine shop and wagon factory of William Hughes were completely consumed by flames on June 21. Hughes' losses are heavy, as he carried no insurance and saved but little from the flames.

ILLINOIS.

CHICAGO—Incorporated: Wemaka Rubber Tire Co., Chicago: capital stock, \$100,000. Incorporators, James Wilson, James Coombs and Frederick L. Norton.

INDIANA.

INDIANAPOLIS—A new industry was added to the large list represented in Indianapolis by the starting of the National Automobile & Electric Co.'s plant, at Twenty-second street and the L. F. & W. Railroad tracks. For several weeks the company had operated a pattern shop in the city, and parts were being made in two or three shops, so material would be ready to commence work. The engine had been started and run several hours to see that the machinery was in good order, and to prevent any delay from the breaking down of any part of it. Forty men and boys were put to work in the various departments, and as the increase in the business demands the working force will be increased. President L. S. Dow said the first day was all that could be expected, and both he and the other officers of the company were highly pleased with the start made. For the present the company will turn out eight or ten complete wagons each week. It takes from sixty to ninety days to build an automobile complete, because so much time is consumed in the finishing and painting departments. Electric and gasoline wagons will be made by the new company. All the parts will be made at the factory except the bodies, which are bought here and finished at the manufacturing plant.

RICHMOND—The work of removing the Gleason carriage hardware factory from Columbus, O., to this city, has begun. The concern will be known as the Richmond Manufacturing Co., and will start with a capital of \$100,000.

TERRE HAUTE—John C. Grubb & Co., of No. 7 South Second street, dissolved partnership May 26. The business will be continued by John C. Grubb & Son.

IOWA.

DES MOINES—The Kratzer Carriage Co., now located at First and Market streets, will have quarters twice the capacity of its present buildings before the first of next year, and is now considering several plans for new quarters. The building it now occupies may be enlarged by the present owners, or the Kratzer Co. may purchase the buildings and construct new ones to accommodate the company's increased business. The Des Moines Union and F. M. Hubbel & Son have offered to build a plant for the company, and lease it for a term of years, and it is possible that such an offer may be accepted. The company expects to employ 150 men within a few months.

KENTUCKY.

OWENSBORO—The Owensboro Wagon Co. has amended its articles of incorporation by increasing the capital stock from \$136,000 to \$250,000. The directors declared a stock dividend of 75 per cent., which increases the stock to \$239,312.50, leaving only \$10,687.50 of the \$250,000 to be sold.

CORYDON—An extensive wagon factory is a new industry that will shortly be established at Corydon. The plant will be operated by the W. H. Keller Co., of Corydon, and H. B. Chikote, of Toledo, O. Its capacity will be about 8,000 wagons annually, and will furnish employment to about 100 men.

MASSACHUSETTS.

AMESBURY—During the past month the carriage industry showed increased activity, and business was rushing.

MERRIMAC—Midsummer continues to find the local carriage business at flood tide. All through the spring months the manufacturers have been very busy, and orders continue to come in in gratifying proportions. One of the largest firms in Merrimac, a concern that is known throughout the country, is authoritatively known to be unable to fill its orders, and is working every department in its plant at high pressure, and the same is generally true of the other Merrimac firms. Out of town carriage manufacturers, who have sent to Merrimac for carriage workers, are finding out that the town is all caught up on surplus help, and they are obliged to go to other fields for labor.

WATERTOWN—Andrew M. Pratt, wheelwright, is a bankruptcy petitioner. Liabilities, \$800; assets, \$30.

MICHIGAN.

IONIA—Fire which started in the dry kiln of the Capitol Wagon Works destroyed the entire stock of hubs, spokes and partly finished wagons, and the stock of valuable lumber, entailing a loss of nearly \$100,000. The factory was 3,000 wagons behind on its orders, and employed 130 hands. Cause of the fire unknown. The works will be rebuilt at once. It is expected to have the kilns and stock buildings ready for use in thirty days. In the meantime, work will be continued in the factory, finishing up the wagons in process. The hardest problem in the situation was the destruction of the entire stock of dried lumber and material, absolutely essential to keep the plant going. The Harrison Wagon Co., of Grand Rapids, and two or three other large factories at once telegraphed offers to furnish portions of this stock.

PONTIAC—Incorporated: Union Buggy Co., \$20,000.

MINNESOTA.

LE ROY—A fire June 1 burned the large Curtis Building, occupied by Chamberlain as a livery, Wibben's wagon shop and other buildings. The loss is easily \$5,000, partly insured.

ST. PAUL—The J. H. Schurmeier Realty Co. and the J. H. Schurmeier Wagon & Carriage Co., of St. Paul, have filed articles of incorporation with the secretary of state. The former has a capital stock of \$75,000 and the latter \$25,000.

MISSOURI.

KANSAS CITY—Incorporated: The Kansas City Buggy Co. Their factory contains 75,000 square feet of floor space, and is located at Ninth and Wyoming streets, in the implement and buggy district. They have a Missouri Pacific switch in through the building. They are making preparations to turn out 10,000 jobs this coming season, and from present outlook will have no trouble in doing so. The firm will be composed of R. L. Hedges, J. C. Davis and C. H. Davis, the latter two being sons of Hiram W. Davis, of Cincinnati, O., and Mr. Hedges, his son-in-law.

NEW HAMPSHIRE.

NORTH CONWAY—Willard D. Barnes' carriage factory, blacksmith shop and paint shop were burned June 22. Barnes' loss is \$1,500; insurance, \$200. Hayford Bros., painters, loss several hundred dollars; no insurance.

NEW JERSEY.

NEWARK—The Automatic Oiling Co. has had its articles of incorporation recorded with the county clerk in Newark. It has an authorized capital stock of \$300,000, and \$1,000 is paid up. Stephen L. McCarthy, Alfred George Brown and George W. Mark are the incorporators.

Incorporated: The American Gear Co. Its incorporators, who are all Newarkers, are William J. Brewer, William Hawkins and George F. Brandenburgh. It will manufacture vehicles and electrical goods on a capital stock of \$250,000, of which \$1,000 is paid up. The local office will be at 160 Market street.

William Hamilton is building an 18 x 24 foot addition to his blacksmith shop, which will be used as a wheelwright and paint shop.

NEW YORK.

CANASTOTA—The plant of the Watson Wagon Co. was recently destroyed by fire. The fire started in the room in the second floor used in putting the wagons together, and was discovered shortly before 12 o'clock. The building was a two-story wooden structure, 35 x 150 feet, and the firemen had a difficult proposition to save any of the building. The loss was estimated by Mr. Watson, the vice-president and general manager of the company, at about \$8,000. The entire insurance was \$3,000 on the buildings and \$13,000 on stock. At the annual meeting of the company, held May 26, the inventory showed that the plant and stock were worth \$54,000, which included accounts, manufactured goods and \$15,000 for patents. Charles E. Crouse, of Syracuse, who is president of the company, wired immediately to lose no time in having the factory rebuilt.

CHARLTON—The wagon shop belonging to the estate of the late L. T. Heaton is being conducted by Charles Saxton.

DEPOSIT—The new firm of Reynolds, Madigan & Gray, wagon makers, blacksmiths and repairers, have a fine new sign in front of their shops on Front street.

DEXTER—Charles Jones and M. Gould have dissolved partnership in the wagon and carriage business. Mr. Jones will begin tearing down the old blacksmith shop this week, preparatory to erecting his new hall. James Fredinburg vacates the shop at once.

DUNKIRK—The Romer Axle Works, which have been closed during the last week, while putting in a new and more powerful engine, will open Monday.

EARLVILLE—Business at the Low-Down Wagon Works has been very brisk thus far this year, and a large force of men has been steadily employed. Several styles of milk and delivery wagons are made to meet the requirements of the trade. As many wagons have been made and sold this year as were sold in the entire year of 1899. Orders are coming in faster than they can be filled with the present help.

FLORAL PARK—The carriage manufactory and smithy of William Gartrell, about a mile and a half east of this village, on the Jericho turnpike, was totally destroyed by fire on June 6. The flames were discovered about 3 o'clock and the neighborhood was soon roused. The large building, with many wagons and hundreds of dollars' worth of materials and tools, was destroyed within an hour. The cause of the fire is a mystery, the workmen declaring that there had been no lights in the building in the early evening, nor any trace of fire of any kind when they closed the place at the ending of work. It is supposed that an incendiary set fire to the building, or that some belated pedestrian carelessly threw a lighted match on the ground, where it ignited some of the combustible material which littered the grounds about the building. The loss is placed at \$5,000, with an insurance on building and stock of \$1,500.

KINGSTON—Owing to the owners of the Kingston Carriage Co. having extensive interests elsewhere, which require all their time and attention, the company has decided to close out their immense assortment of carriages, sleighs, harness and bicycles, and afterwards either sell or rent the property.

OLEAN—The Whitney hub factory is to remove from Olean to Galeton, Pa.

NEW YORK—The I. S. Remsen Manufacturing Co., of Nos. 740 to 750 Grand street, Brooklyn, say that the present month's business, as far as it has gone, fully doubled that of the same period last year.

The Mutual Wagon & Carriage Co., of Eighth avenue and Bank street, having been having quite a call for business and general delivery wagons all of last week. They report business as being very good.

Business at the Sanford Repository, of Nos. 186 to 192 Clinton street, has been very good for the past ten days. They have been selling many carriages, such as phaetons, T carts and a great deal of basket work. The Bailey pneumatic, for which they are the sole agents for Long Island, has also had a large sale.

The Lengert Wagon Co., of No. 302 West Fifty-third street, say that trade is still quite good. They are having a special sale of wagons and carriages, which they say will be continued for some time. These sales are held every year at this time, so as to make room for the new stock which will shortly begin to arrive.

"We have been doing our share of the business," said Manager Carlough, of the New York Wagon Co., of Eighth avenue and Thirteenth street. "I can't say that we are exactly rushed, but there has been enough doing the past week to keep us fairly active." This concern is showing a capital lot of business wagons, and also many different styles of pneumatics.

An exceedingly interesting display of summer vehicles of every description is to be seen at the repository of J. B. Brewster & Co., in the Old Guard Building, Broadway and Forty-ninth street. Some novel designs and beautiful color effects are shown.

J. F. Goodrich & Co., Broadway and Third street, say that business keeps good in pleasure carriages, light station wagons, wagonettes, basket phaetons and park traps.

The Blaurock Carriage Co., dealers in carriages and vehicles, of No. 1593 Broadway, has made an assignment to Morrison V. R. Weyant. The deed was dated June 15. It was signed by John A. Blaurock, president, and attested by J. S. Jenkins, secretary. The company is a New York corporation, organized on May 22, 1899, with a capital stock of \$25,000, Mr. Blaurock having started the business in 1898. The annual report, filed January 16, showed assets of \$21,736 and liabilities of \$15,419. The liabilities are about \$10,000, and the actual assets, it is said, will not realize more than \$1,500.

Incorporated: Manhattan Carriage Co., of New York City. Capital, \$5,000. Directors: D. J. B. Dupignac, William H. Brearley and William Schreiber, New York City.

W. H. D. Crittenton has sold his wagon works out at West Farms, Bronx Borough, to Thomas Russell, and will soon open a new shop in the Borough of Manhattan. His office is No. 75 East Tenth street.

SYRACUSE—Charles F. Saul, manufacturer and dealer in wagons and dealer in seeds, stated that business has been very good this spring. The wagon business started off late on account of so much snow in March, but it is very fine at present. People are demanding a good class of work, and the demand is very active. Mr. Saul thinks that the situation is favorable in spite of the fact that this is a Presidential year.

SAYRE—The hub works at Sayre is to make valves and turn special work for the Cayuta Wheel Foundry. Several men are at work putting the plant in shape for operation. It is hoped that the company will have work enough to keep the plant running all the time.

VALATIE—W. H. Peterson has reopened his wagon making shop on the corner of Mechanic and Spring streets and is ready for business. He will do repairing and painting, and furnish estimates for new work.

WATERTOWN—The Union Carriage & Gear Co. are very busy. They have both recent and early orders which have been somewhat delayed. June orders came in plentifully. The season has elongated itself remarkably. The indications are excellent for a big cutter trade this fall. A large number will be gotten out. There are now 100 men at work.

Ira Teeter, who has held for more than three years past the position of designer and draughtsman for the H. H. Babcock Co., of this city, has accepted the position of designer, draughtsman and general superintendent of the Watertown Carriage Co., and will assume his new duties July 1. Mr. Teeter is one of the more progressive young men who, by dint of hard work through technical and practical experience, has reached an enviable position in his vocation. His many friends in Watertown will wish him success in his new and responsible position.

OHIO.

AKRON—The contracts for the erection of the immense plant of the Consolidated Rubber Tire Co. will be awarded in a few days. The plant will be located on the Hart allotment in East Akron. The company will manufacture the Kelly vehicle tires. These have been manufactured heretofore by the B. F. Goodrich Co. The Kelly tire is largely used all over the world. An official of the Goodrich Co. stated Friday that the fact that the Kelly tire was to be made in East Akron would make no difference in the working force of the Goodrich Co.

FINDLAY—The foundation for the Findlay Carriage Factory's new plant on West Crawford street has been completed, and the work of laying brick will be commenced. When completed it will be one of the best arranged plants in Northern Ohio.

GALION—The city council of Galion has voted \$10,000 to buy real estate and buildings for the Shupp carriage factory, which was recently destroyed by fire. The amount is to be paid back at the rate of \$1,000 a year without interest.

PENNSYLVANIA.

CARLISLE—Everly & Orris, of Mechanicsburg, have shipped to an English firm 100 wheels of a very heavy pattern. These wheels are to be used on gun carriages for the British army in South Africa.

DENGLERS—Daniel Albright, the popular carriage manufacturer, will start to build automobiles in the near future.

LANCASTER—Negotiations are said to be pending for the removal of Downey Bros.' large spoke and bending works from Lancaster to York.

MONTROSE—E. D. King, an expert wagon maker and painter, of Cortland, N. Y., has moved to this place, and will occupy the shop with Frank Strange in the alley near Perigo's livery stable.

NEWTOWN—The wareroom of J. V. & C. Randall, carriage and wagon builders, of Newtown, was destroyed by fire on June 7, together with the carriage house and stable. There were thirty-

two wagons, carriages and sleighs in the building, and these were lost. The wareroom was 40 x 60 feet and the stable 20 x 20 feet. The loss is estimated at \$5,000. It is believed that the fire was of incendiary origin. The Randalls sent out word that the manufacturing and repairing departments are not interfered with, and business will go right on.

PHILADELPHIA—Owing to the large increase in their business, Davie & Co., rubber tire manufacturers, of Camden, N. J., have been compelled to move to larger quarters, and after July 2 will be located at 1310-1314 Wallace street, Philadelphia.

YORK—The charter for the Martin Carriage Works, which was recently incorporated, has been entered for record in the office of Recorder Bowman. The capital stock of the company is \$300,000.

Extensive improvements are being contemplated by the Hoover Wagon Co. The firm is overrun with orders, and the present commodious plant in the East End is not near large enough. The most important improvement now being considered is the erection of three additional stories to the back building, which is 183 x 83 feet in size. The addition will also be of brick, and will be used as a painting and finishing department. Within the past few days this company has also began the manufacture of surrey, depot wagons, business carriages and other light vehicles.

RHODE ISLAND.

NEWPORT—George P. Lawton has purchased and refitted as a carriage repository the carriage factory of the late Achilles Stevens, corner of Spring and Barney streets, where he will carry a fine line of carriages. He will keep on hand an assortment of surreys, carryalls, phaetons, goddards, traps, runabouts, basket wagons and carts, with or without rubber tires, also a line of business and order wagons suitable for the Newport trade, and has made arrangements with the leading manufacturers of the country that will enable him to fill any special order at the shortest possible notice.

WISCONSIN.

ANTIGO—The entire plant of the Antigo Hub & Manufacturing Co. burned June 14. The loss is \$20,000, well insured. The plant was owned by H. J. Frick, who will probably rebuild immediately.

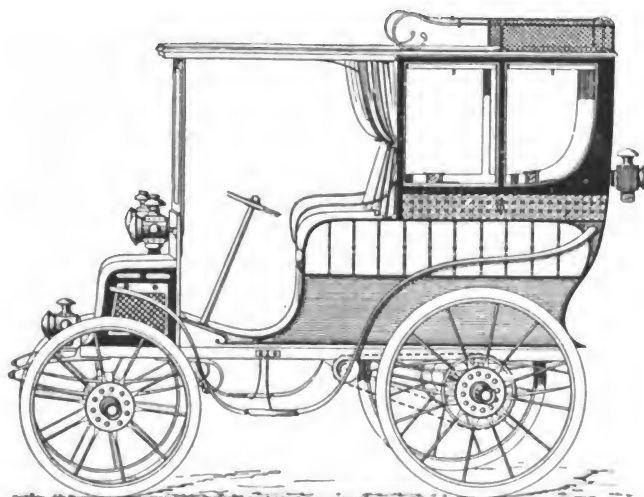
JANESVILLE—The factory of the Wisconsin Carriage Co. burned June 15, entailing a loss of \$30,000, with \$17,000 insurance. The origin of the fire is unknown. There was over \$20,000 worth of stock in the factory. Until recently the force has been working night as well as day to get out the orders, and they were still about 100 orders behind. The plant was owned by local parties and will probably be rebuilt.

PRAIRIE DU CHIEN—A fire originating from a defective flue destroyed the blacksmith shop and wagon manufacturing establishment of W. Tesar & Sons June 24. The loss is quite heavy.

KENOSHA—The Wisconsin Iron Co., a new company recently incorporated, with a capital stock of \$50,000, took charge of the Lippert iron works in this city on June 22. The new company will engage in the manufacture of wagon skeins. The officers of the company are C. N. Prentiss, of Marinette, president; J. B. Benson, of Kenosha, vice-president and treasurer, and C. E. Benson, secretary.

WASHINGTON.

SPOKANE—Studebaker Bros., the famous wagon makers of South Bend, Ind., have decided to establish an independent agency in Spokane. They have rented a large wareroom with a larger basement on Sprague avenue, and already have a fine supply of wagons and other implements on the way. One of the chief features of the new warehouse will be the complete line of automobiles which they intend to carry. Messrs. Plough and Watters will be at the head of the local agency. Both men have been connected with the company's agency in Portland.



LIMOUSINE AUTOMOBILE.
(From *La Carrossier Français*.)

Wants.

Help and situations wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word.

SITUATIONS WANTED.

Experienced salesman wishes position with first class house to travel. Thorough knowledge of Spanish language and customs. Address, "J. M. A.," care of THE HUB.

An experienced carriage smith would like a permanent position in or near New York City, as a finisher on the repair floor, and to make himself generally useful. Correct habits, middle aged, a good manager, and can speak both English and German. Best of references. Moderate salary. Address, "ENERGETIC," care of THE HUB.

Experienced New York City foreman carriage painter is open for engagement in or near New York City. Accustomed to good light and heavy work. Steady and reliable. Address, "BRUSH," care of THE HUB.

Wanted—Contract for season of 1901 for complete construction in factory producing 2,000 vehicles or more, by two practical men. Competent in drafting, building, trimming and finishing vehicles. References. Address, "CARRIAGE MFRS.," care of THE HUB.

New York City foreman carriage painter desires position. Experienced on high class light and heavy work. References. Address, "E. A.," care of THE HUB.

Wanted.—Position as foreman carriage paint department in good factory or good custom shop, by steady, temperate man, twenty-four years' experience. For past six years have held large contract. Western experience. Address, "CONTRACTOR," care THE HUB.

HELP WANTED.

First class finisher, competent to take charge of paint shop. Address, "WHOLESALE BUILDER," care of THE HUB.

First class smith, competent to take charge of carriage smith shop. Address, "BOX 84," care of THE HUB.

First class body maker, competent to take charge of body shop. Address, "HIGH CLASS," care of THE HUB.

Wanted.—A first class superintendent for a small carriage factory; one who understands the construction of a vehicle from beginning to end. Would be expected to make from two to three thousand jobs per year. Reference required. Address, "CARRIAGE BUILDER," care of THE HUB.

Wanted—Hustlers to secure new subscribers for THE HUB. A good chance to make money easily. Subscription price \$2.00 a year. Liberal commission paid. Address, Subscription Department, THE HUB, 24-26 Murray street, New York.

MATERIALS WANTED.

Wanted.—A good second-hand dash stitching machine. Address, JAMES GOULD CO., Albany, N. Y.

PATENTS.—H. W. T. Jenner, patent attorney and mechanical expert, 608 F street, Washington, D. C. Established 1883. I make an examination free of charge, and report if a patent can be had and exactly how much it will cost. Send for circular.

FOR SALE.

A 1900 latest model Winton motor phaeton in first class condition. purchased last month. This is no sacrifice sale. The purchaser gains the advantage of an immediate delivery. I want a two-seater. same make. Address, J. M. BARTON, Rome, N. Y.

The United States and Canadian patents on spring lock whip socket. For information, address, HARRY PAUL, Chatham, N. Y.

Healy & Co. victoria with detachable seat, suitable for carrying two to six persons. In first class condition. Will sell for one-fifth of original cost. Address, SWIFT & CO., Purchasing Department, Union Stock Yards, Chicago, Ill.

Solid rubber tire patent. Entirely new principle. Cannot get off the rim. Economical. Experienced tire men say it is the best they have ever seen. For particulars, address, "RUBBER TIRE," care of THE HUB.

Brick carriage factory, excellently equipped for automobile building. Four stories, 70 x 128. Located on corner. Elevators, 40 H. P. Corliss engine, first class machinery, etc. City of 75,000, about 100 miles from New York. Splendid shipping facilities. Factory now in operation and in good condition. Address, "M 25," care of THE HUB.

COLOR SECRETS.

No. 30.—Match-Making.

To produce the exact shade of cloth is a very difficult problem, and one which few dyers can solve. In a hundred attempts to make precisely the same black or blue, a dozen may come near enough to deceive the common eye. To reproduce the exact shade is the most difficult problem in the Color business; but it is one which the Murphy people never fail to solve. In a hundred attempts to make the same (of anything in Murphy Colors) a dozen may show a difference which only the expert can detect. That dozen will be thrown away. Nothing which pretends to be a matched color, and is not, ever leaves the Murphy factory. That is our loss.

We claim no secret and subtle intuition, no mystery of genius, no miraculous infallibility: but we do claim to exercise the highest scientific knowledge of the business; and we do claim to use the rare talents of patience and care, right up to the limit. If we make a mistake, or have an accident; or if any of the thousand unavoidable circumstances go against us; we pay for the faulty result ourselves, and try again—until the result is perfect.

Anybody can make a color which resembles a previous color. We put out no resemblances: we duplicate the color. If you can tell which is the original and which is the duplicate, we will make you a present of the duplicate and another—and forty more—until you cannot tell which is which: but you need not hope to get color for nothing, by any such blunder of ours.

MURPHY VARNISH CO.

Please mention "The Hub" when you write.

PREMIER

PREMIER

To the Carriage Trade:

IN the pages following, from 47 to 55 inclusive, we are bringing to your attention the superior qualities of the Premier Wagon, and our object in so doing is to sell the gear used in this construction, as it is not our purpose to sell jobs in the wood and iron, except for introductory purposes. We have no facilities for manufacturing bodies, and we simply have them made for us to introduce the gear to the trade generally, and until this is accomplished we will furnish the trade with a few jobs in the wood and iron, and with the Premier gear only.

You will notice by the engraving that the body is special, and it would be well for manufacturers to order one job in the wood and iron as a sample, although if they prefer we can furnish them with blue-prints showing construction of body for this job, without extra charge.

As this is the only assembled vehicle which we offer or sell, we have designated it as "The Premier Wagon," and said name will apply to no other job properly, even though such jobs may have other gears made by this Company.

THE PREMIER TUBULAR gear is assembled with side bars only, as shown in the cuts in pages following.

THE CENTURY TUBULAR gear is assembled with Elliptic Springs, but we *cannot* furnish it assembled with body. For description of The Premier Wagon, please refer to the *nine* pages following.

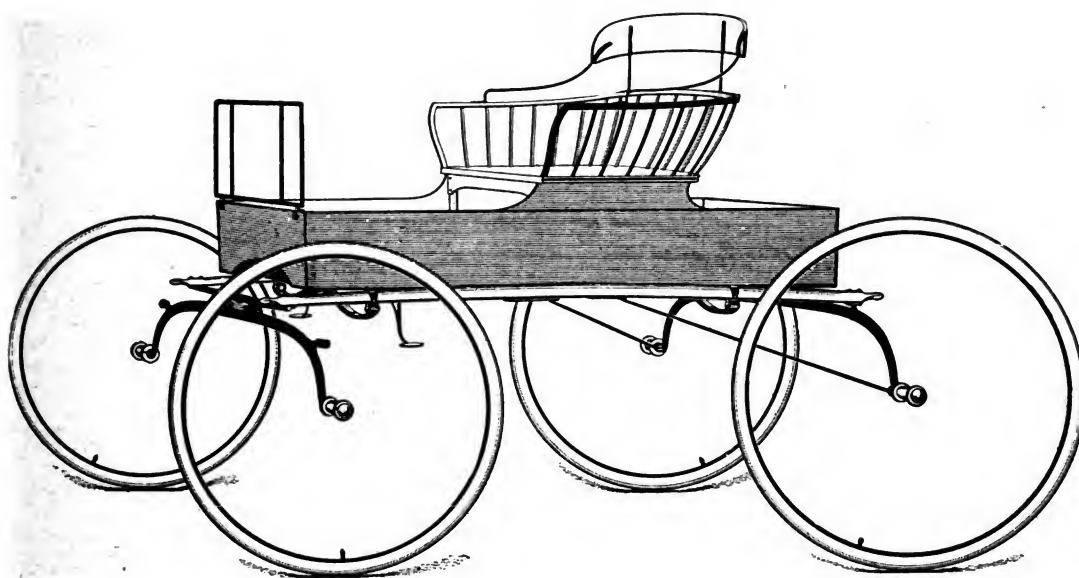


PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M'F'G.
CO.PREMIER
M'F'G.
CO.

The Premier Wagon



OUTSIDE of New York City and a few fastidious road drivers elsewhere, side bar wagons have not met with special favor for some time past. This condition was brought about by the construction formerly used and the stiff riding qualities of such wagons.

Without question the side bar wagon is greatly preferred to the end spring wagon by road drivers, providing that equally good riding qualities are assured, as it is very much neater, more genteel, and follows a horse better.

THE PREMIER WAGON'S riding qualities are equal to the best and superior to the average Elliptic Spring Wagon ; further, it is built for hard everyday business use, and its enduring qualities, owing to its construction, are remarkable.

In the next several pages we will endeavor to give the why and wherefore, and trust you will agree with us.



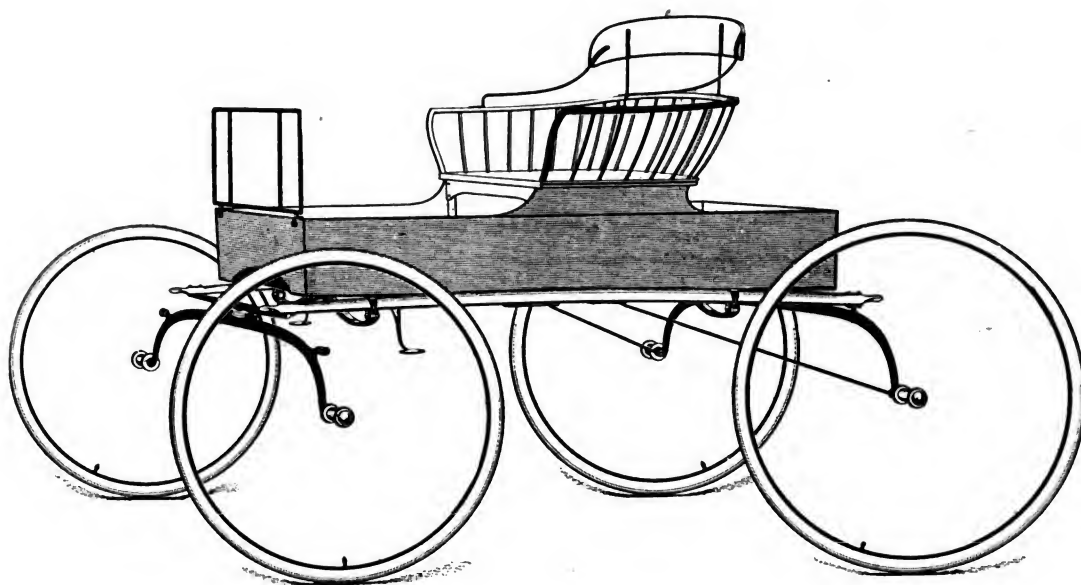
PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER

PREMIER

The Premier Wagon



THE Premier Gear which is embodied in the construction of the Premier Wagon is made of steel tubing of the highest quality, and each axle is made in one piece and without any brazed joints. The carrying capacity is slightly over 100 per cent. greater than the same amount of steel in solid form, and the rigidity is such that it is the only construction which can be safely used for high arch axles without innumerable braces and stays, which detract from the appearance and enduring qualities of a first-class job.

Every part of this gear is made of the best material obtainable, and when it is assembled it has true running qualities, obtained only by the most careful workmanship and special facilities for doing such work. It seems almost unnecessary to say anything about the Premier bearings, etc., as they are so well and favorably known that further description would seem like unnecessary repetition; however, we will be glad to give the fullest information regarding every part of this job and trust you will write us.

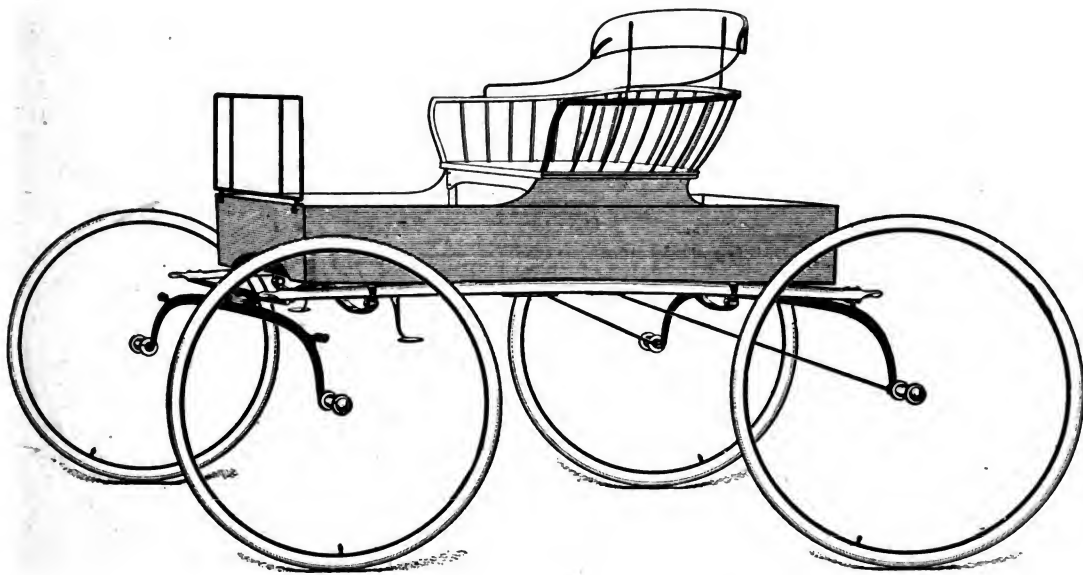


PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M.F.G.
CO.PREMIER
M.F.G.
CO.

The Premier Wagon



THE Bodies used with the Premier Gear are made and ironed for us by one of the most careful builders in New Haven, whose reputation for good work is second to none, and when used with the Premier Gear a job is produced excelled by none, regardless of price.

The shafts, like the gear and the body, are made special, and their appearance corresponds to the high class appearance of the gear and body.

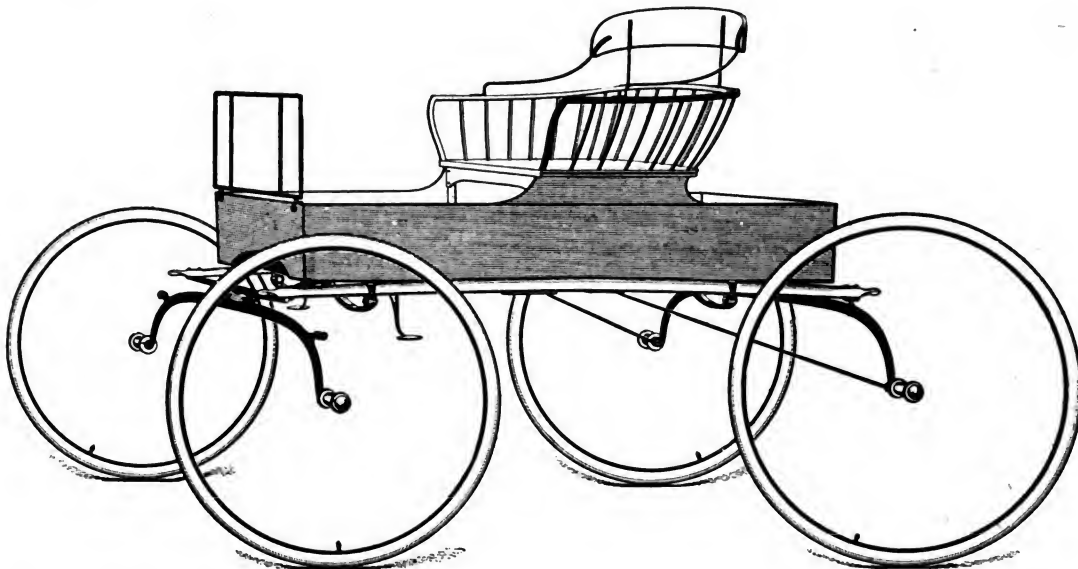
When selecting the various parts entering the construction of the Premier Wagon, we have endeavored to get the greatest carrying capacity with the least weight, and the fact that our regular two-passenger job weighs about 100 pounds less than the average two-passenger job, demonstrates that we have accomplished what we set out to do. We did not do this at the expense of strength, durability, etc., as the wagon will actually stand more rough usage than the heavier type, because every part entering the construction of it is made of the best material obtainable and assembled with the greatest accuracy. Please remember it retains all of the advantages of the side bar wagon and rides as easy as a wagon with Elliptic springs.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

The Premier Wagon



The Premier Wagon, as above illustrated, weighs :

For two passengers,	147 Pounds.
For one passenger, with springs, side bars and road tires, about . . .	102½ Pounds.
For one passenger, without springs, side bars and with track tires, about	76 Pounds.

For business, road driving, etc., the two-passenger job is without question the easiest running vehicle for the purpose which is made. It rides as easy as an end spring wagon, and is light enough to step a trotter without fear of ruining his gait. The axle is arched where it should be, and is stronger than any other known constructions. It is the cheapest wagon, because the gear will practically wear forever by renewing the bearings every few years.

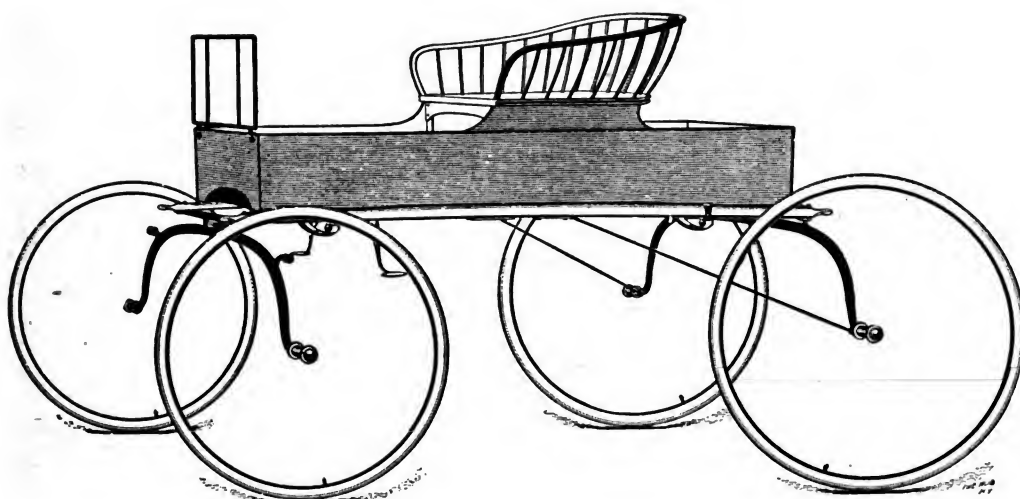
Before offering this wagon to the public we have tested it in every conceivable way, and we are ready to say that it is "all right," and guarantee every part of it. We sell it only with high-grade tires, and the weight and size of the latter are governed by the style of the gear, as it is our aim to make this wagon first-class in every sense of the word. To assure you that we mean every word we say we are willing to send one of these jobs in the white to any good house on approval, and if it is not as represented they may return it.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

The Premier Wagon



THE above cut illustrates the one-passenger job with side bars, best grade of Timken springs, wire wheels with 30 and 32 x 1 $\frac{3}{4}$ inch tires. This wagon will weigh about 30 pounds more than a regular track wagon, but it can be safely used over all kinds of roads and its riding qualities are excellent. Owing to its rigidity and the fact that it is assembled absolutely true in every way it will draw much easier and follow a horse far better than the average 75-pound road wagon. This is especially true where the horse is unsteady or for amateur racing.

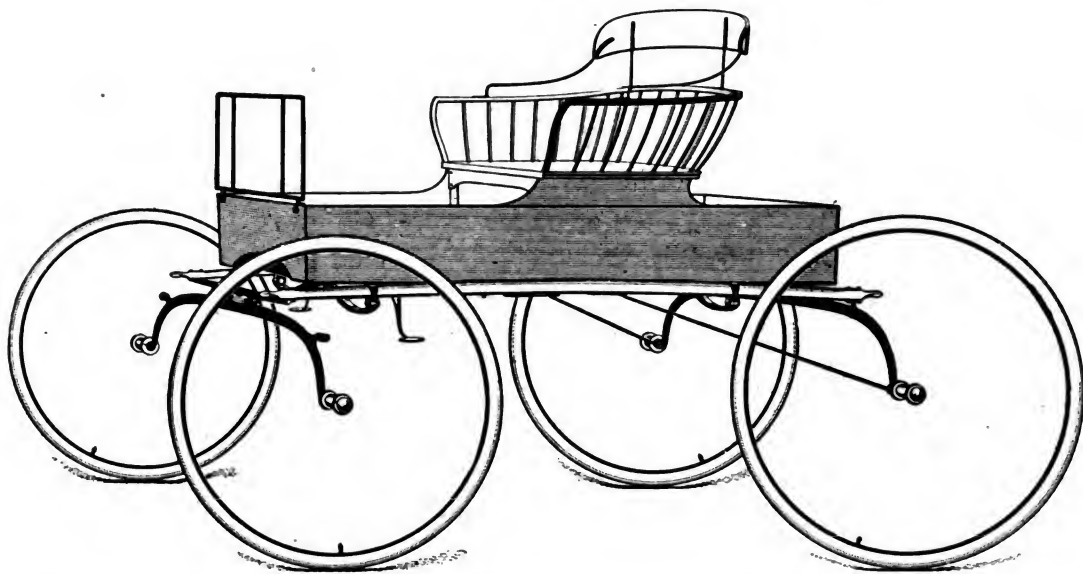
The same job, without side-bars, springs, and with regular track tires, will weigh about 27 pounds less. The 75 pound job is only intended for matinee racing, as we believe that only a track wagon can be made satisfactory without springs. There is not over one second's difference between the 75 and 100 (approximate) pound jobs, and we recommend the latter as its road riding qualities are excellent.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

The Premier Wagon



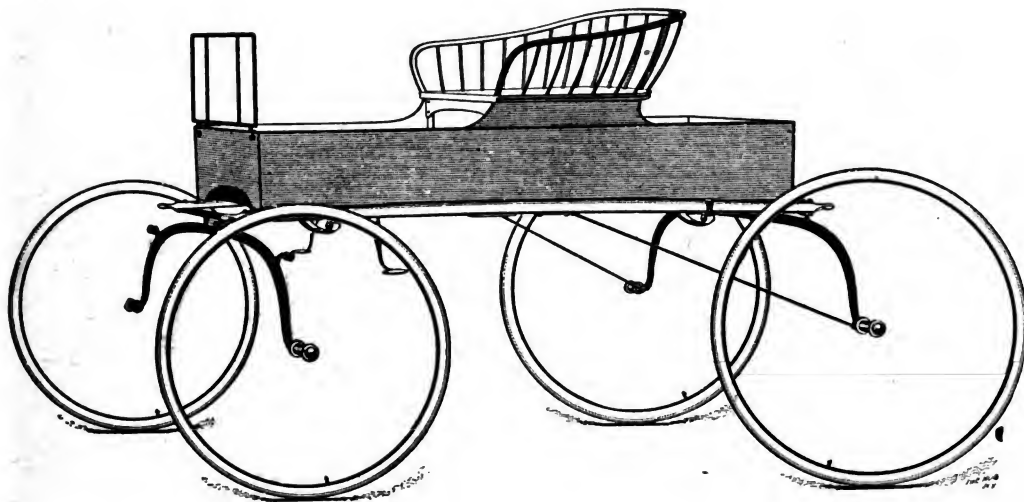
AS illustrated above, we use on the two-passenger job wire wheels with 34 and 36 x 2 inch tires, but we also build the same gear with higher arch axles, on which we use wire wheels with 30 and 32 inch tires. We can furnish the gear with wire wheels and 1¾ inch tires when it is preferred, but we recommend the 2 inch tires, owing to the additional service they give and their superior riding qualities. You may not have thought of it before, but we find that a job of this kind, with the high-arch axle and 30 and 32 inch wheels, will draw lighter and is faster than the job with 34 and 36 inch wheels. Another thing may not have been brought to your attention: A 36 inch pneumatic tire will wear almost twice as long as a 46 inch pneumatic tire, also a 30 inch tire will wear nearly one-third longer than a 36 inch tire. In confirmation of the foregoing we might cite to you the fact that bicycles were first used with 60 inch wheels and were gradually brought down to 24 and 26 inches, and finally settled at 28 inches. The same thing can be said regarding the sulky, only the variation was greater, as pneumatic tires were used with 48 inch, 42 inch, 32 inch, down to as low as 16 inch, and finally settled on 28 inch; therefore, it must have been found to be the best size and the most satisfactory for the purpose. These points should be considered when ordering a wagon and we call them to your attention, and are pertinent to jobs intended for speeding purposes.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

The Premier Wagon



PNEUMATIC tires are not only practical on light wagons, but on every vehicle as well.

At the same time there is a certain percentage of drivers who are sticklers for light-weight vehicles of easy draft, and with that they demand an axle arched immediately back of the spindle, so they can step a trotter without fear of striking the axle. The job as above illustrated is specially intended for that purpose, and we can give you axle clearance from 22 inch to 26 inch.

For a 15-3 hand horse the above job just as it stands is the right height; it is fitted with wire wheels having 30 inch and 32 inch tires. The shafts are made special and set just right on the size horse mentioned above. In constructing this wagon every detail has been carefully considered, as we want the wagon to please you and your customers, and we know you will hear nothing but good words from every one which you put out.



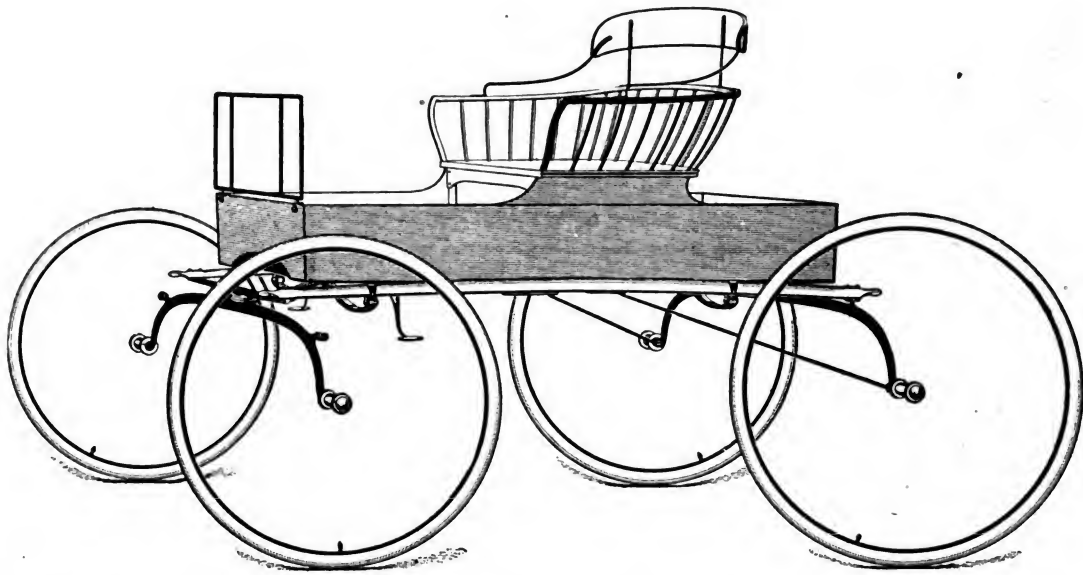
PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER

PREMIER

The Premier Wagon



EVERY good thing, like the Premier Wagon, offered to the trade is extensively copied, by some very cleverly and by others very crudely, but you cannot be mistaken on a genuine Premier if you will apply the weight test, to say nothing of a few exclusive parts about the gear, which we control.

We also make a tubular gear with Elliptic springs, which is a most excellent gear, as it is constructed like the Premier; that is, first class in every way, and we list it as THE CENTURY TUBULAR GEAR. We do not furnish this job complete in the wood and iron, because any 54 inch body can be fitted to it.

The Premier Gear requires a special body; therefore, we will furnish it in the wood and iron to builders who prefer to buy it that way, or until such time as they can make the bodies.

We will be glad to correspond with you about the job in the wood and iron, or the Gear, as we are prepared to furnish them in quantities.



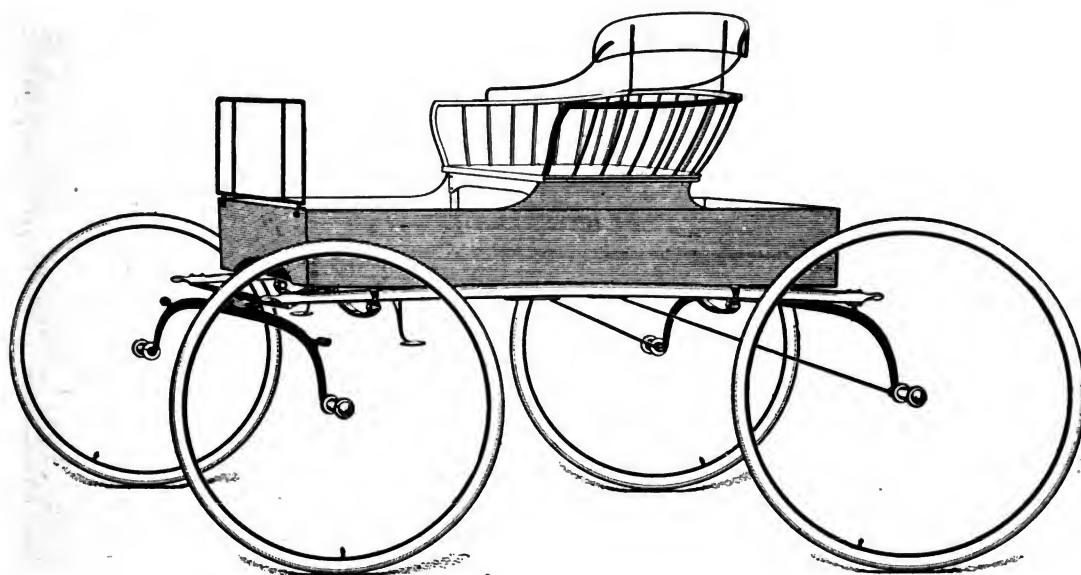
PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.

PREMIER
M'F'G.
CO.PREMIER
M'F'G.
CO.

Please mention "The Hub" when you write.

The Premier Wagon



AS we have said elsewhere, the durability, carrying capacity and riding qualities of the Premier Wagon have been thoroughly tested during the past three years. Some of these wagons, as above illustrated, have been in use for the past three seasons, and outside of the bodies and tires they are practically as good as new. One special job, which we have applied specially severe tests to we will refer to, weighs 119 pounds and has carried three people whose aggregate weight was 560 pounds, and it generally carries 400 pounds. After such severe usage constantly, we might say abuse, we find the gear and wheels in excellent condition. We simply mention the above to illustrate the great carrying capacity and enduring qualities of the Premier Gear as we construct it.

This job is strictly alone in its class, and is not put out in competition with any other pneumatic wagon, as it will be chiefly sought after by a class who are fastidious about all their driving vehicles, and recognize the value of a light wagon with great carrying capacity, light riding and easy running qualities.

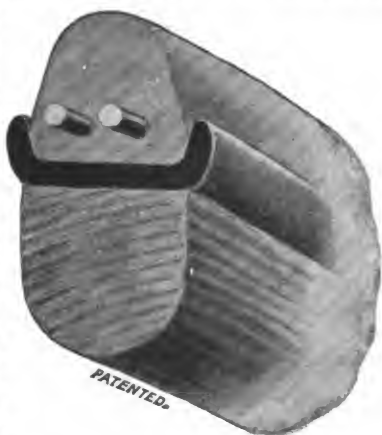
All wholesale builders of high grade work will furnish this job, when specified for, to dealers on short notice. While the price of the job is necessarily higher than other high grade wagons, we contend that it is the cheapest wagon on the market for reasons above stated.

We hope to list you among our good customers.



PREMIER MANUFACTURING CO.,

HARTFORD, CONNECTICUT.



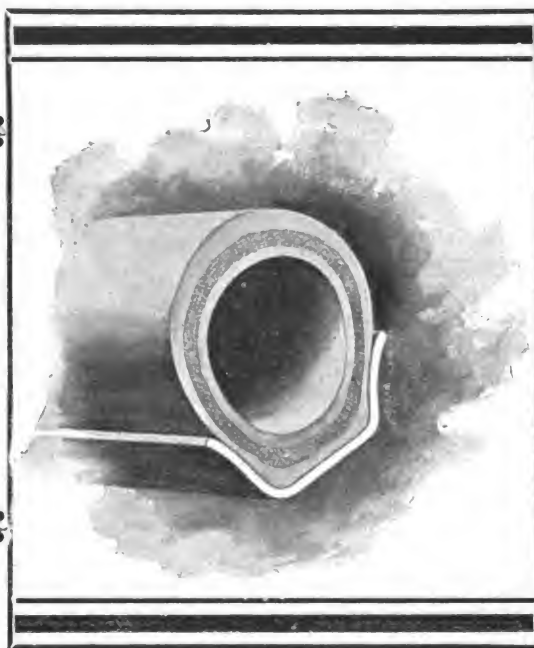
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matic tires, two of
the best rubber tires
made.

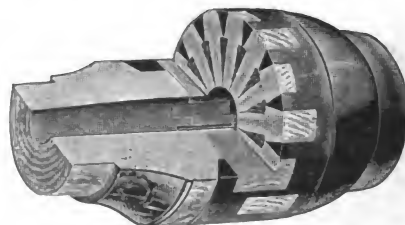
Our leader is the SCHAD HUB. This makes the neatest and most
durable wheel on the market for light work.



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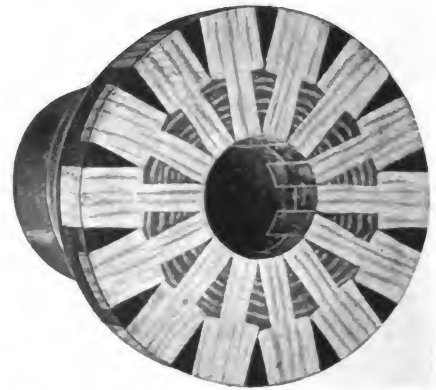
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THE "CLARK" WHEEL



A wood hub wheel is the handsomest, but the hub will check and will not hold the spokes.

A Sarven hub will hold the spokes, but it is not neat in appearance.

A Warner hub will hold the spokes, but its general make up is against it.

A Kenney hub will not hold the spokes when the tire is loose. It is impossible for the spokes to get loose in the "CLARK" hub if the tire is not tight.

The above cuts of the "CLARK" hub illustrate a hub that has the strength of the Sarven and Warner and resembles a wood hub. The trade has demanded and will appreciate a hub that will have

the strength of the Sarven and Warner and still resemble a wood hub wheel. I guarantee all wheels with the "CLARK" hub against spokes getting loose.

All wheel makers can supply these wheels by ordering the shells of the Naugatuck Malleable Iron Co., Naugatuck, Conn., but if your wheel maker does not, write me, and I will make you prices on them that are satisfactory. I am the oldest wheel maker making wheels at the present time, and have been at work for a long time to perfect this hub, and now have it. Correspondence respectfully solicited.

I manufacture Sarven, Warner, Kenney, compressed band and plain hub wheels, but the "CLARK" wheel is superior to any of them.

WM. B. CLARK, Waterloo, Seneca Co., N. Y.

FRANK M. CLARK, Manager.

High Grade Wheels.

Zwick & Greenwald Wheel Co.

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And WAPAKONETA BENDING CO.

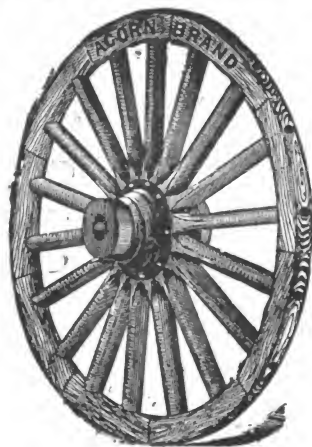
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Heavy Wheels for Business Wagons a Specialty.

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Second Growth Hickory Rims, Spokes
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The Acorn  Brand is made of Second
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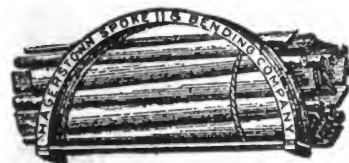
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The Hagerstown Spoke  Bending Co. Hagerstown, Maryland,
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Spokes and Rims

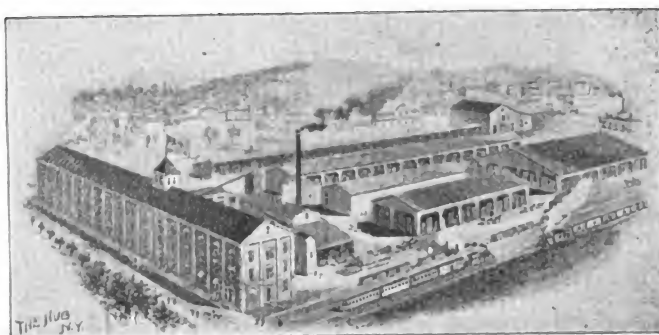
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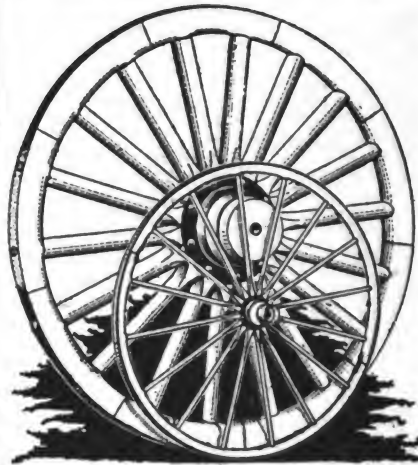


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No 48.

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CARRIAGE AND BUGGY BODIES

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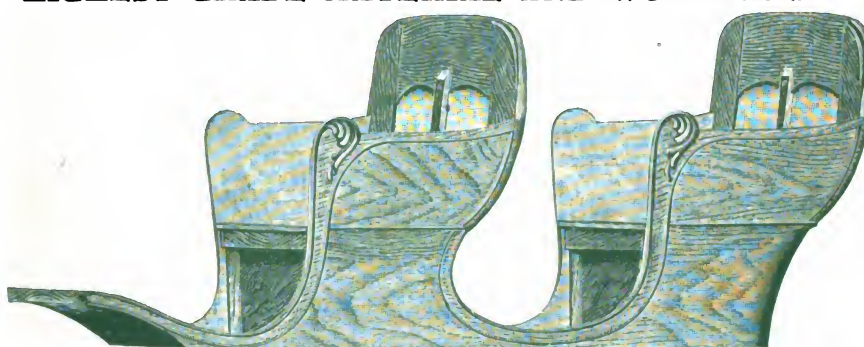
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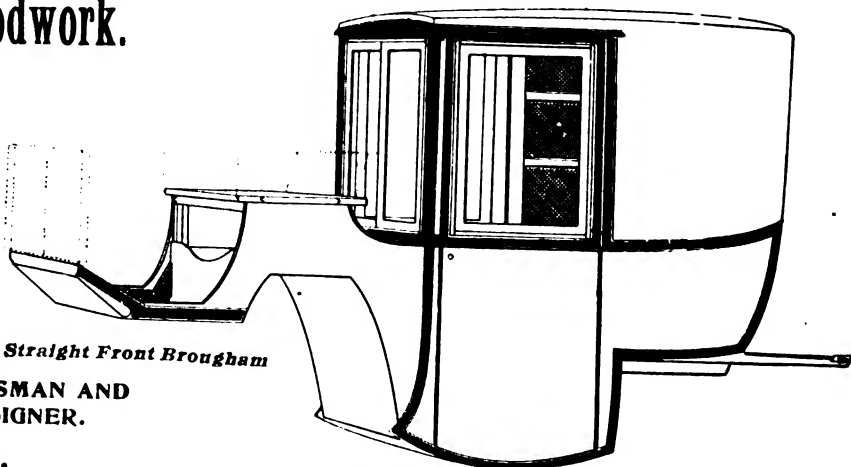
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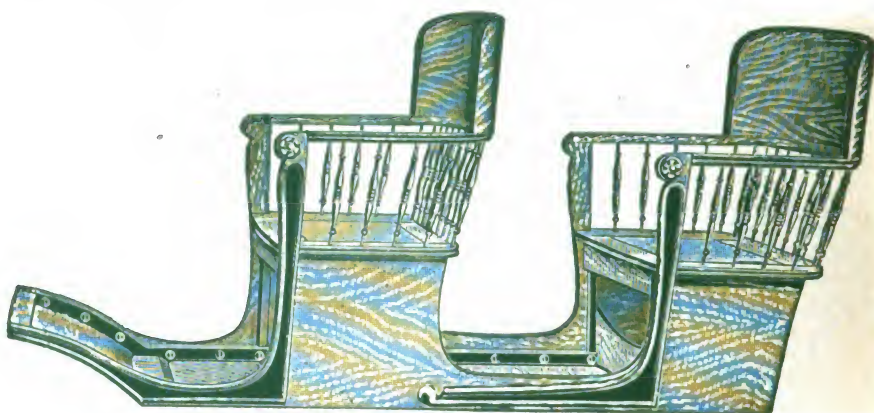
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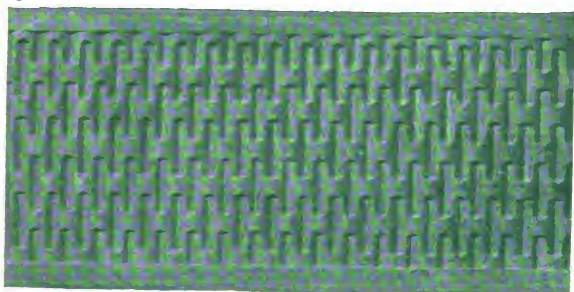
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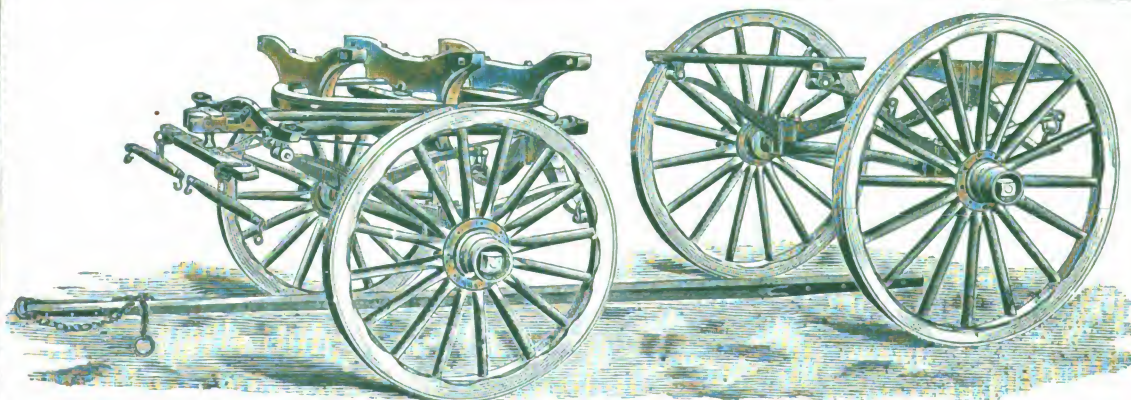
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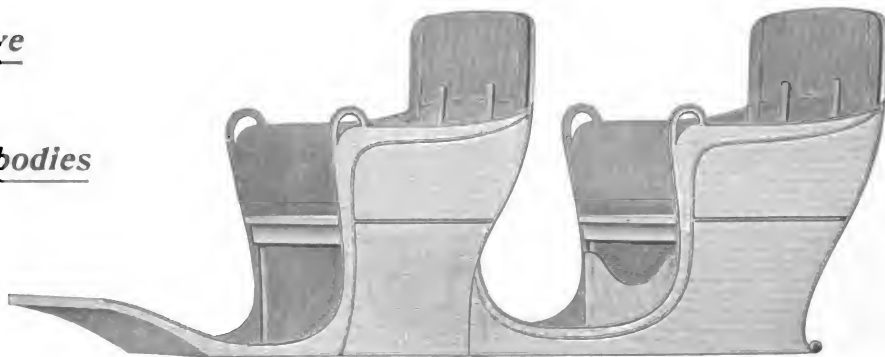
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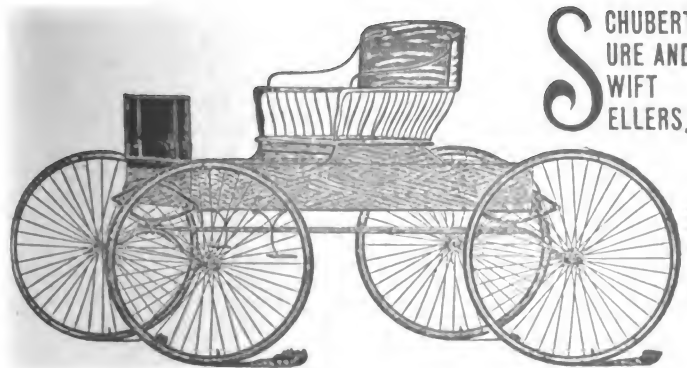
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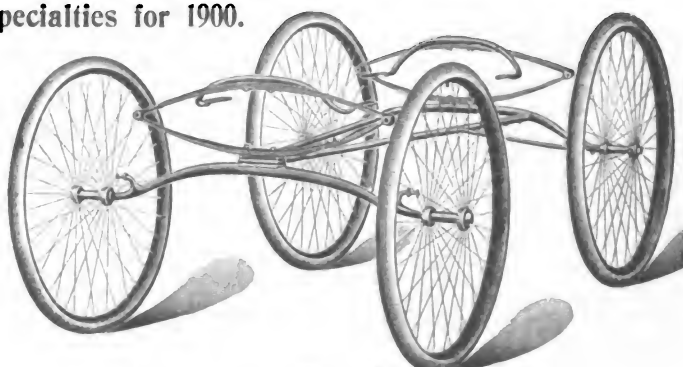
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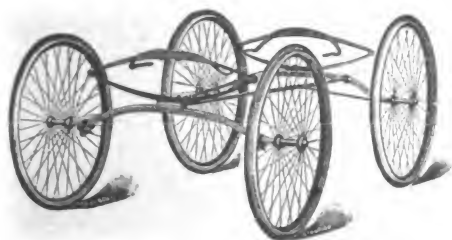


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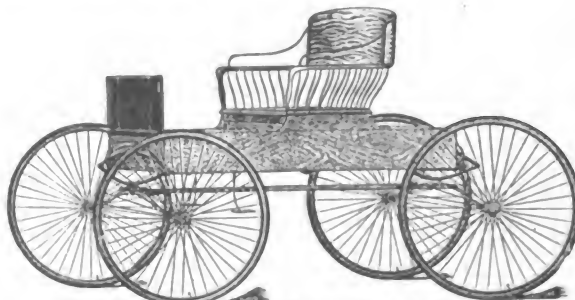
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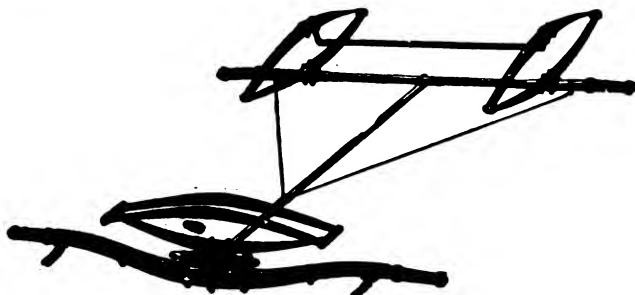
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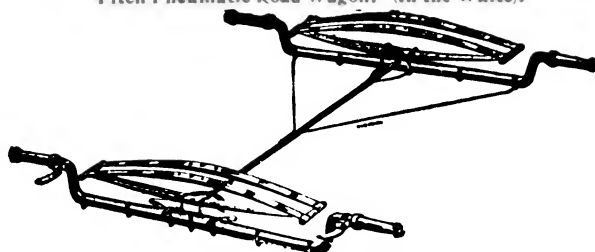
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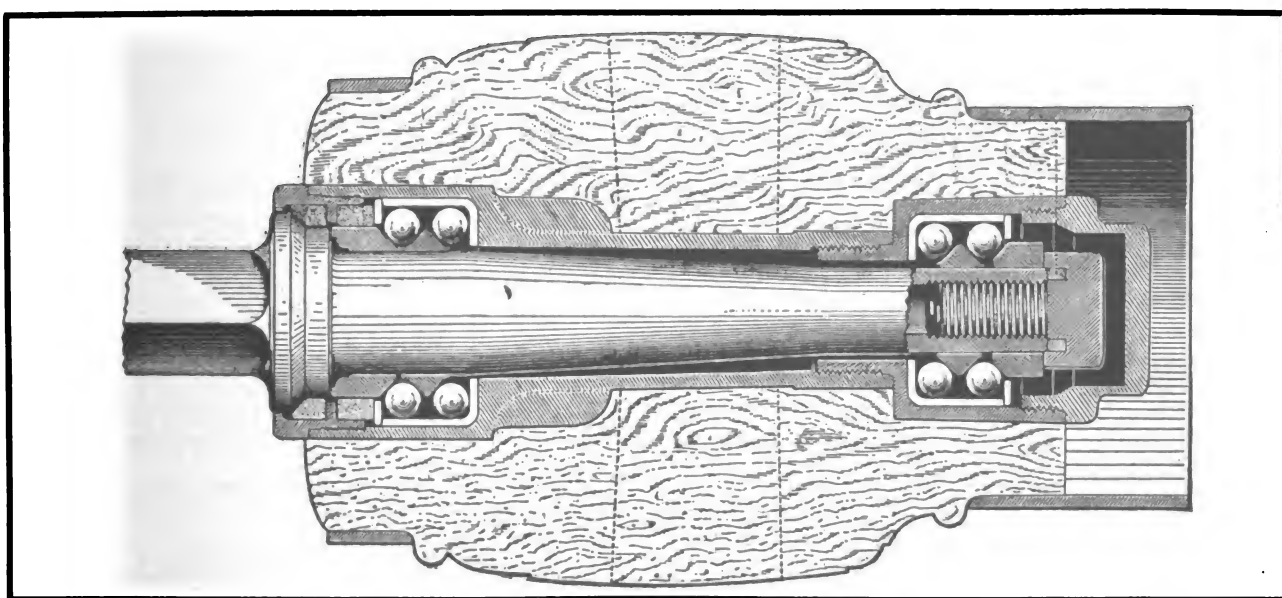
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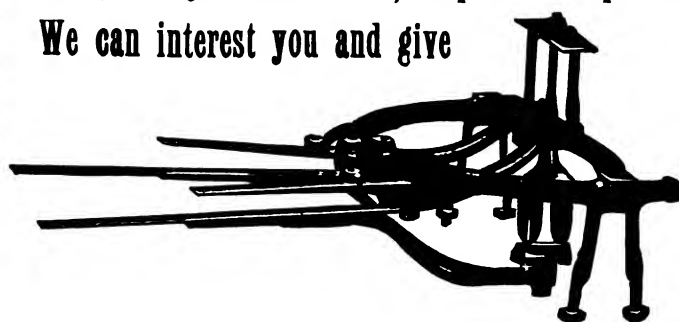
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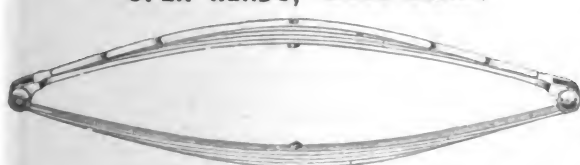
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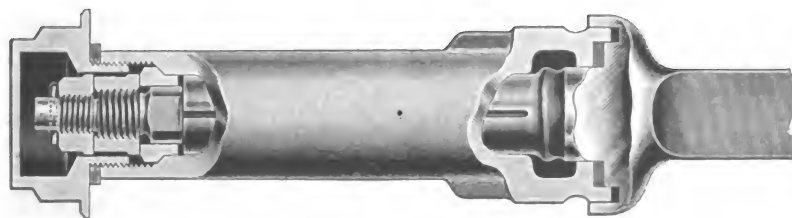


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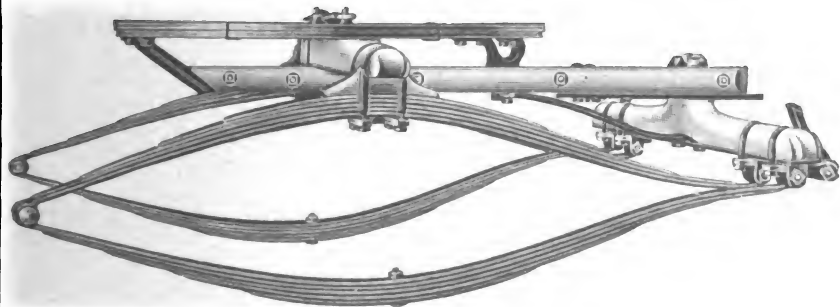
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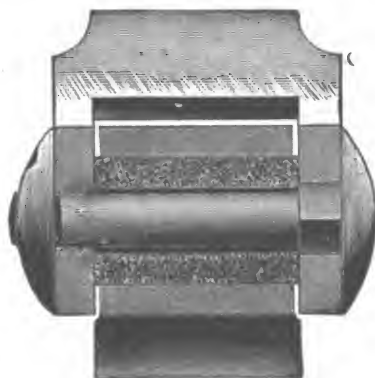
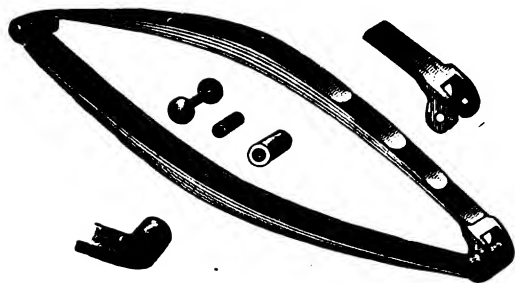
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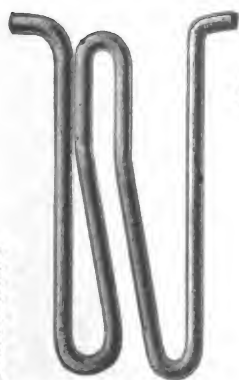
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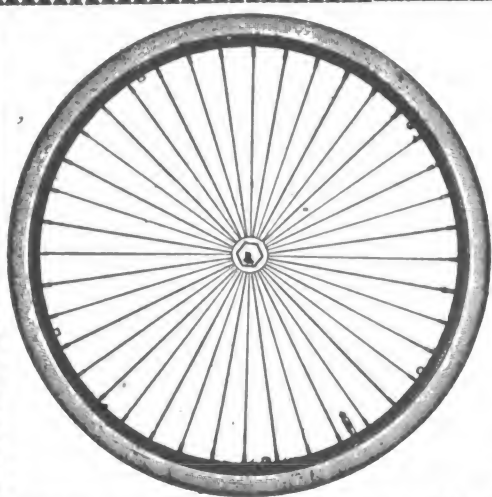
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12 Styles Gear Sets
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3 Styles Steering Axles
for Motor Carriages

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THE SUNRISE OIL AND DEVELOPMENT CO., McKITTRICK DISTRICT, KERN COUNTY, CALIFORNIA.

This company owns four 40 acre tracts of patented land in the celebrated McKittrick District, a district that has become famous for large producing wells. Their plant is one of the best grade in California, "a Standard No. 1 Rig." Development is rapidly bringing this district to the front. Consult reports of oil experts as to the McKittrick District. A purchase of oil stock in a legitimate company is an investment, not a speculation.

Principal Place of Business, SAN JOSE, CAL.

OFFICERS:

O. L. BAKER, President. R. D. McARTHUR, Treasurer.
GUY H. SALISBURY, Secretary.

WE OFFER FOR SALE 5,000 SHARES AT \$1.00 PER SHARE.

Right reserved to advance price without notice. For particulars address

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The "Golden Tree"

THE WORLD'S RICHEST GOLD MINE.

Located in the Great Ketchikan District of Alaska.

IT IS A MINE THAT WILL SOON BE A DIVIDEND PAYER. The outlook in the present tunnel is more favorable than the famous Treadwell Mine, located a short distance from it, which is now paying millions in dividends annually.

The "Golden Tree" mine is at tide water and under the warm Japanese Current, and can be worked every day in the year. The entire property of the Golden Tree Mining and Milling Co. is underlaid with the **Richest Free Gold-Bearing Quartz**, and the ledge ore now assays over \$200 per ton.

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The same rich vein of free gold, sulphides and tellurides runs under all this section of contiguous property. **This is no exaggeration or dream**, for results have been realized from all of twenty nearby mines by actual work and development. Among these mines are the Golden Standard (owned by Standard Oil magnates), Sea Breeze, Gold Coin, Gold Mountain, Sea Level, Gold Hill, Bragdon, Moran, Sutton, and others.

We recommend to investors without hesitation the Golden Tree as being a safe and conservative investment. It will easily pay 40 per cent. annual dividend on the investment within a very short time.

We offer a limited amount of Treasury Stock (8,000 shares), fully paid and non-assessable, **at 25 cents on the dollar**. This Treasury Stock is sold for the express purpose of putting in stamping and other machinery for the further development of the mine.

Fidelity of management of the property is secured by the fact that Hon. John R. Rogers, Governor of the State of Washington, is the president of the company, and Hon. John H. Reeves, one of the Justices of the Supreme Court, is its Vice-President.

Write or call for prospectus, subscription blanks and full reports giving detailed information. Call and see specimens of the ore; also original assays, which will bear out the truth of the above statements.

Golden Tree Milling and Mining Co., DAVID C. STAM, Managing Director,
32 BROADWAY, NEW YORK.

Office of GARDENHIRE & VANDIVERT, Attorneys for the Company.

SOBRANTE OIL INVESTMENT CO.

EL SOBRANTE RANCHO, CONTRA COSTRA COUNTY, CALIFORNIA.

Composed and officered by some of the most prominent business men of the State.

WE OFFER TO THE EASTERN PUBLIC **10,000 Shares Of Stock**
AT 50 CENTS PER SHARE.

The company is organized for the purpose of purchasing, leasing and selling properties, and for boring and drilling wells for the production of oil, gas, mining for coal and other mineral products. A considerable area of land has already been secured under long time leases, on favorable conditions, in San Pablo Valley, Contra Costa County, upon what is called "The Castro Tract," about 10 miles from Oakland, or by a shorter drive over the country highway from Berkeley which runs through the property, as does also the California & Nevada Railroad. It is intended to secure other properties by purchase or lease, and to sell, lease or develop them.

We would like a few representative eastern business men to become interested in our company, and therefore our projects. The Standard Oil Company started an infant. We are quite a large one already. This is an opportunity of a lifetime. For particulars, address

SOBRANTE OIL CO., SAN FRANCISCO, CAL.

E. C. BALDWIN, Eastern Agent, Mansion House, Albany, N. Y.



Immovably Fixed.

The Bradley Shaft Coupling is Ball-bearing.

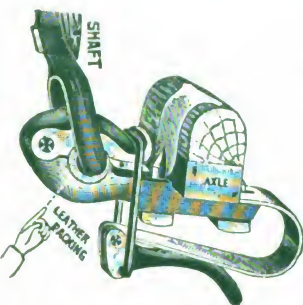
The ball is on the shaft end. Around the ball is a packing of, hard oak leather.

The ball is held equally secure in all directions. It cannot side-wear or side-rattle.

Every straight bolt or similar bearing in other couplings must side-wear and will rattle.

Our sales are constantly increasing. All the best vehicle makers supply our coupling because they know it adds greatly to the value of their work.

Prices and full information sent on request.

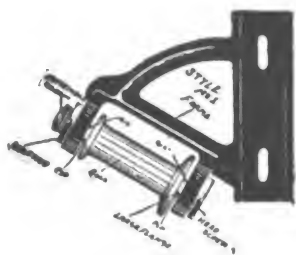


In the Bradley coupling the leather is the only thing that can possibly wear. As the leather remains fixed the only wear on it comes from the ball working inside. This wear is practically nothing, and the renewal of the leather is seldom necessary.

This ball-bearing feature is only one of many points that make the Bradley the most desirable shaft coupling in the market.

C. C. BRADLEY & SON, Syracuse, N. Y.

CHARLES AUSTIN BATES N. Y.



No. 1 Pattern.
Fits any straight bottom
vehicle.

ROLLER CHAFE IRONS

BUY THE BEST.

Ganon's Anti-Friction Wheel Guard

Furnish Guards for all Kinds of Vehicles.

These Rolls Never Refuse to Turn. No Springs and No Rattle.

For prices and Catalogue, address

GANON & TRON MFG. CO., Indianapolis, Ind.

Drills with $\frac{1}{2}$ inch Shanks, Fitting Blacksmiths' Drill Presses.



Straight Shank Drills for Wood.



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CLEVELAND, OHIO, U. S. A.

"A right judgment draws us a profit from all things we see."



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ILLUSTRATING

"STANDARD" TOOLS

FOR

Carriage, Wagon and
Automobile Work.



94 Reade Street, NEW YORK.



Trade-Mark.

WHEELS

LIGHT
AND
HEAVY.

... Barven, Compressed and Wood Hub ...

Capacity **250** Sets Per Day.



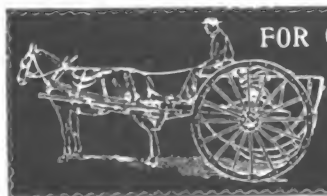
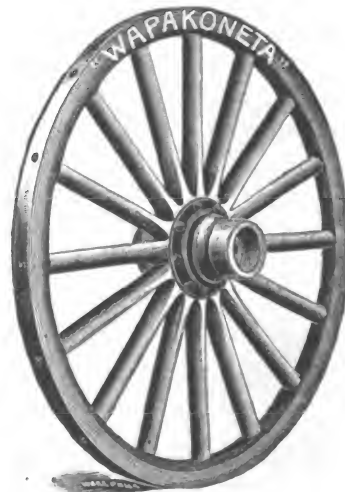
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FOR SUPERIORITY IN CONSTRUCTION, WORKMANSHIP AND MATERIAL.

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WAPAKONETA, OHIO.



FOR GARBAGE, NIGHT SOIL, Etc.

TIGHT AND ODORLESS.
BOOKLET AND PRICES ON REQUEST.

U. S. SANITARY CO.,
WASHINGTON, D. C.

The "Henry" Single Leaf Rib Spring,

IN EVERY SHAPE AND LENGTH YOU WISH,

FOR CARRIAGES, CARTS, WAGONS AND SEATS.

The Henry Spring Co., Winsted, Conn.

SEND FOR REDUCED PRICES.

SOLE MANUFACTURERS

Please mention "The Hub" when you write.

The McGOVERN COLD TIRE SETTING MACHINE

HAND AND POWER MACHINES

TO SUPPLY THE DEMANDS OF THE
CARRIAGE AND WHEEL TRADE, AND ALSO THE BLACK-
SMITH AND GENERAL REPAIRER.

A power machine with an automatic attachment, and where the operator has absolute control of the machine; can stop or start it instantly at any point in its operation.

Simple in construction. Powerful in operation. Reasonable in price. Does its work thoroughly, accurately and rapidly, giving proper and uniform dish to wheels.

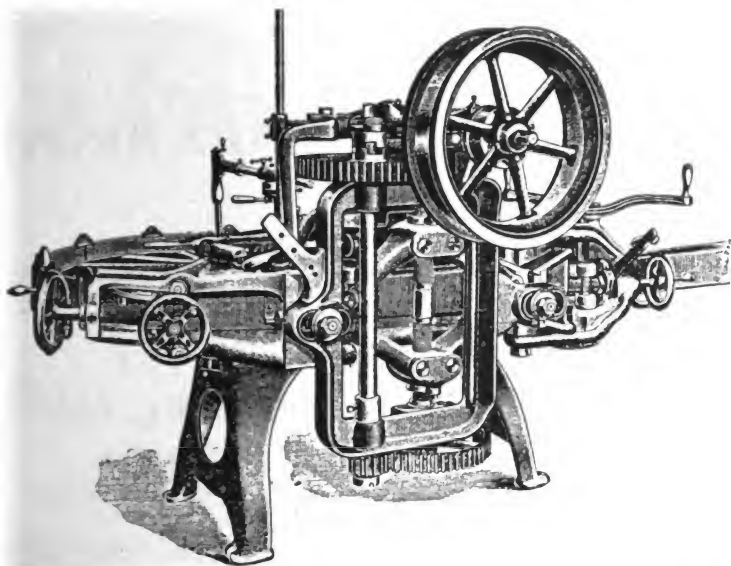
THE NEW MODEL McGOVERN COLD TIRE SETTING MACHINE with its increased capacity, simplicity and strength, all three points being more than tripled in this new machine, we guarantee to set Tires ranging from $\frac{3}{4}$ inch to $2\frac{1}{2}$ inch x $\frac{3}{4}$ inch. Our daily capacity from 800 to 1,000 wheels.

NOTICE.—We now offer old model hand and power machines at a low figure.

.....SEND FOR DESCRIPTIVE CATALOGUE.....

Address all correspondence to

**The Tire Setting Machine Co.,
LIME ROCK, CONN.**



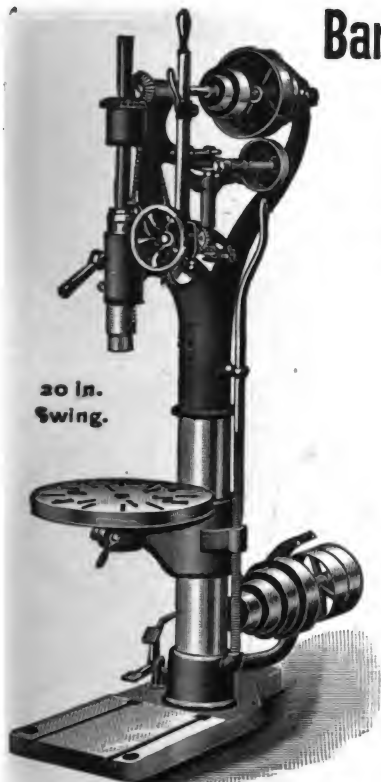
Barnes' Upright Drills,

8 in. to 42 in. Swing.

Single, Multiple, "Series," Power Feed, Automatic Stop, Back Geared, Sliding Head, Stationary Head, Worm Feed, Lever Feed.

Send for Catalogue.

**W. F. & Jno. Barnes Co.,
588 Ruby St., Rockford, Ill.**



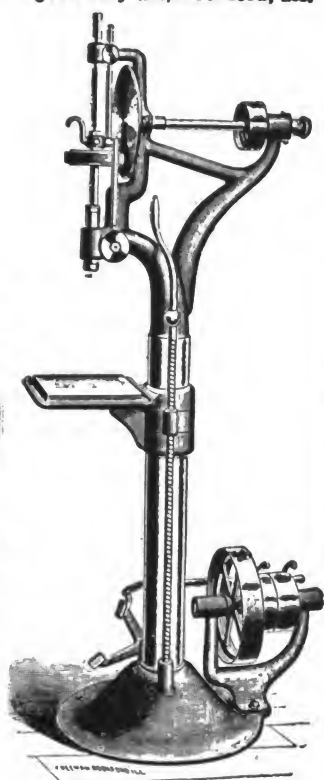
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BARNES' New Friction Disk Drill, FOR LIGHT WORK.

Has these Great Advantages:

The speed can be instantly changed from 0 to 1600 without stopping or shifting belts. Power applied can be graduated to drive, with equal safety, the smallest or largest drills within its range—a wonderful economy in time and great saving in drill breakage. Send for catalogue.

**W. F. & Jno. Barnes Co.,
588 Ruby St., Rockford, Ill.**



THE IDEAL TIRE UPSETTER.

The advantages of the Ideal are:

The tire cannot kink. One man can operate it. One movement does the work.

It will shrink light Buggy tire.

It will shrink Heavy Wagon tire.

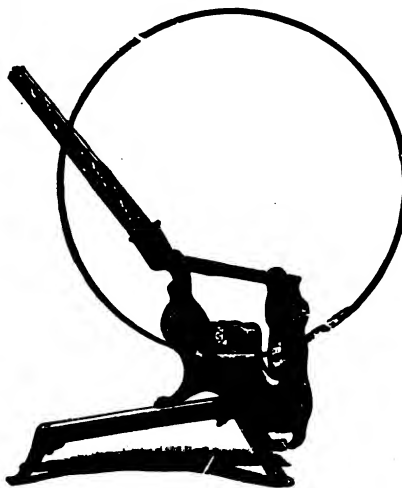
It will shrink Truck tire.

It will shrink perfectly all kinds and thicknesses of tire.

It is the easiest handled.

It is the most durable.

It is the latest and best.



Send for Circular and Price.

Manufactured only by

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CLIMAX WELDING COMPOUND.

It Welds Steel Tires, Axles and Springs as Easily as Iron.

HARDWARE DEALERS SELL IT.

SAMPLES SENT ON RECEIPT OF 10c. IN STAMPS.

CORTLAND WELDING COMPOUND CO.,

CORTLAND, N. Y.

THE WOODS is full of **CHEAP NECK YOKES** and **NECK YOKE CENTERS**, but when a carriage manufacturer wants a good, safe yoke for his own use he always buys **COVERT'S**. You should insist upon it and accept no other.



Our assortment supplies the demand in the States and foreign countries for any style of yoke or centre.

Every Yoke is Tested and Every Centre is made of Oak Tanned Harness Leather.

COVERT'S SADDLERY WORKS

1875

1900

We are the oldest and most extensive manufacturers of Neck Yokes and Neck Yoke Centres. Also Harness Snaps, Horse and Cattle Ties, Wagon Jacks, etc., etc. Ask your jobber for Covert's.
FARMER, N. Y., U. S. A.

Please mention "The Hub" when you write.

Established 1850.

Defiance Machine Works

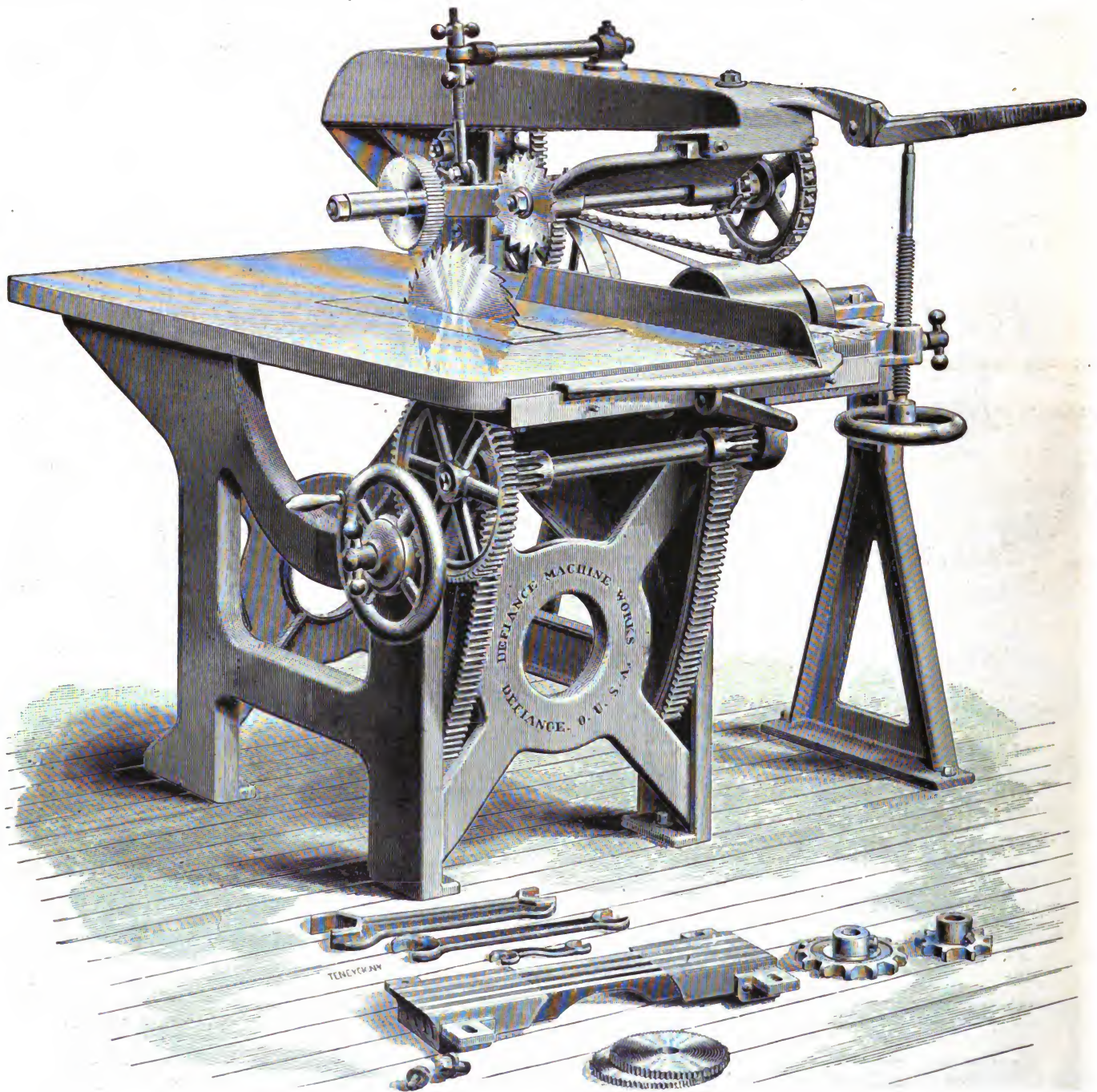
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INVENTORS AND BUILDERS OF

PATENT WOOD-WORKING MACHINERY

FOR MAKING HUBS, SPOKES, WHEELS, WAGONS, CARRIAGES, RIMS, SHAFTS, POLES, NECK-YOKES, SINGLE-TREES, HOOPS AND HANDLES.

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No. 2 Patent Power Feed Ripping Saw,

With Elevating Table, Patent Fence and Feeding Out Roll. Export Shipping Weight, 1,700 Pounds. Net Weight, 1,100 Pounds. Cubic Measurement, 67 Feet. Cable Word, SARONY.

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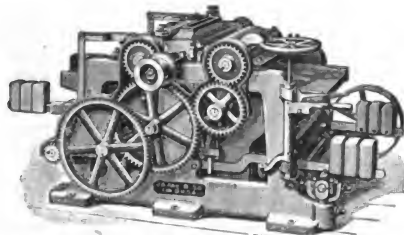
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OF EVERY DESCRIPTION.

A Full Line of Machines for Wagon, Carriage, Buggy, Wheel,
Spoke, Handle and Wood-Working Establishments Generally.

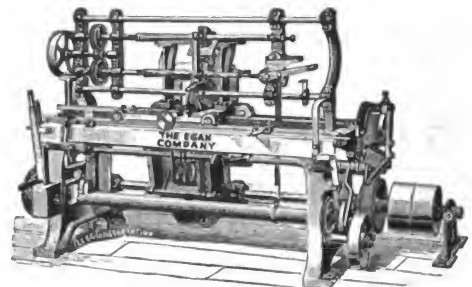
... Investigate These Two Machines ...

Variable Feed.
Bed raises and lowers
on long inclines.
We make 5 sizes,
to plane
24, 26, 30, 36 and 42
inches wide and
six inches thick.



FAY No. 19 SINGLE CYLINDER CABINET
SMOOTHING PLANER.
Patented December 19, 1899; February 6,
1900; May 8, 1900.

It's
Worth
Your
While.



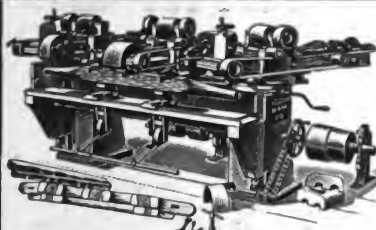
EGAN No. 2 AUTOPLATIC SPOKE LATHE, WITH
PATENT AUTOPLATIC LIFT TO
VIBRATING FRAME.
Patented December 19, 1899.

Particulars and Prices
on Application to

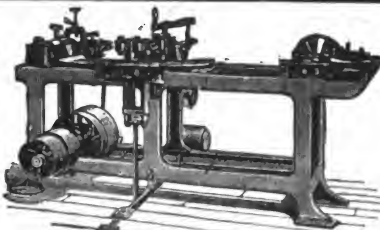
J. A. Fay & Egan Co.,

Owners & Operators;
J. A. FAY & CO.
THE EGAN CO.

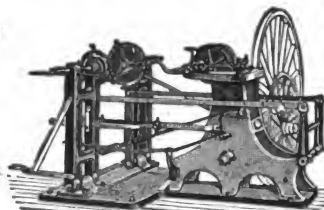
421 to 441 West Front St., - CINCINNATI, O.



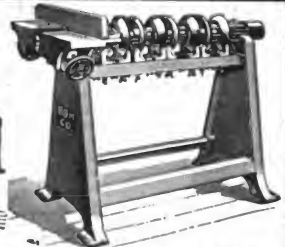
Improved Automatic Axle Gaining Machine.



Felly Cut-Off, Boring & Doweling Machine.



No. 2 Wheel Polisher.

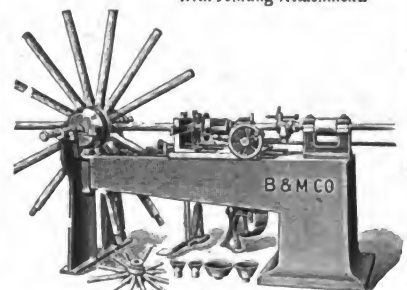


Improved Gear Rounding Machine,
With Jointing Attachment.

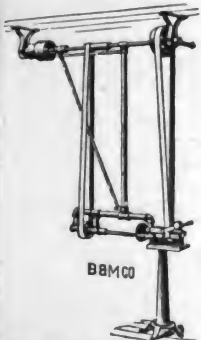


IMPROVED WHEEL, HUB-BORING
AND BOXING MACHINE

**THE BENTEL & MARGEDANT
COMPANY.
WOOD WORKING MACHINERY.
HAMILTON, O., U.S.A.**



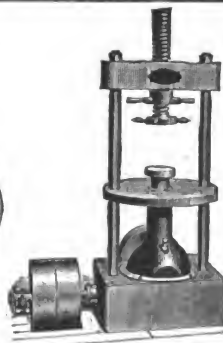
HEAVY GIANT WHEEL TENONER.



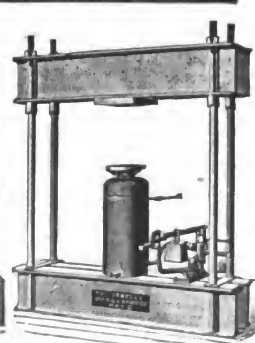
Hub Band Grinding and
Polishing Machine.



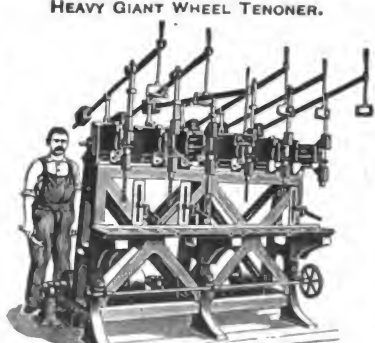
Top of Felly-Rounding Machine.



Improved Cam Press.



Hydrostatic Wheel Press.



Vertical Six Spindle Gang Boring Machine.

Please mention "The Hub" when you write.

"Silver's" New Band Saws for

CARRIAGE MAKERS,
WAGON MAKERS AND
WOOD SHOPS OF EVERY KIND.

IN SIZES:

20 in. machine for foot or belt power.
26 in. machine for foot or belt power.
32 in. machine for belt power.
36 in. machine for belt power.

LIST PRICES,

\$50.00 to \$130.00.

Special Discount to Carriage
and Wagon Makers.

These machines are symmetrical and modern in design, and absolutely rigid and strong for the heaviest work coming within the range of each machine.

Ask for 1899 12 page
Circular showing all
sizes.

Manufacturers also of "DOLE'S"
and "SILVER'S" HUB BORING MA-
CHINES, "DOLE & DEMING" SPOKE
TENON MACHINE, "SILVER'S" and
"ADVANCE" DRILLS, Etc., Etc.

EVERY MACHINE GUARANTEED.

THE SILVER MFG. CO.

339 Broadway,

SALEM OHIO, U. S. A.

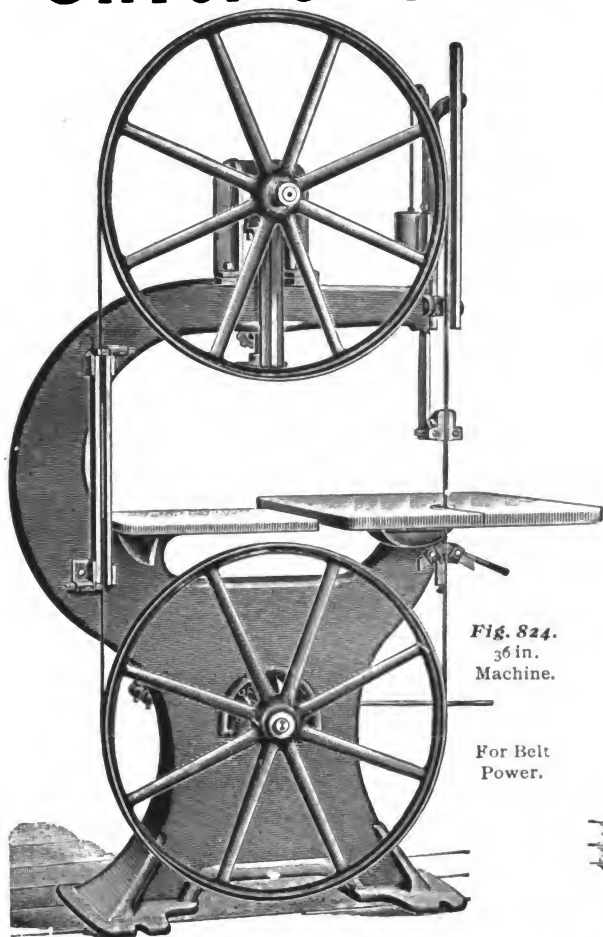


Fig. 824.
36 in.
Machine.

For Belt
Power.

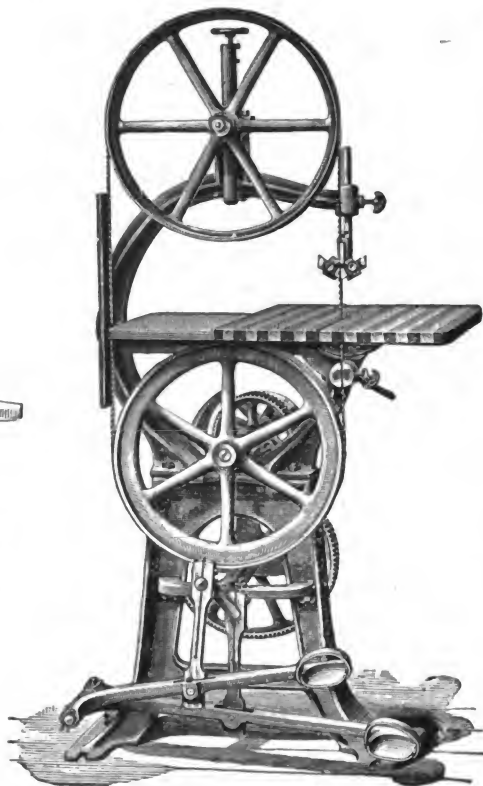


Fig. 721.

20 in. Machine Combined Foot or Belt Power.

LABOR-SAVING MACHINERY

... OF ALL KINDS FOR...

**PUNCHING,
SHEARING,
TIRE WELDING,
BENDING AND
FORMING,**
:FOR....

Carriage Shops
Wagon Works, Etc., Etc.

DESIGNED AND MANUFACTURED BY

THE LONG & ALLSTATTER CO.

HAMILTON, OHIO, U. S. A.

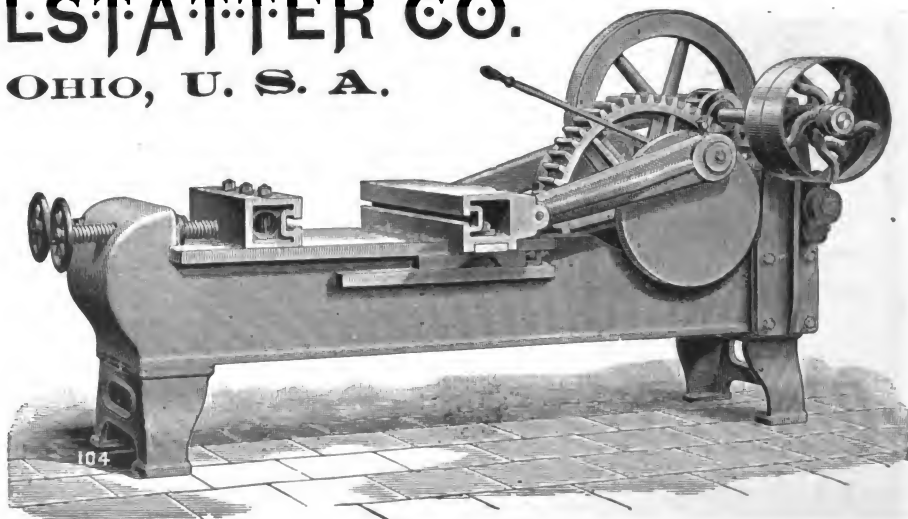
...Also make Machinery...

FOR

**ROLLING MILLS,
STRUCTURAL IRON WORKS,
RAILROAD SHOPS,
BOILER WORKS,
BRIDGE WORKS, Etc., Etc.**

If Interested write for Catalogue.

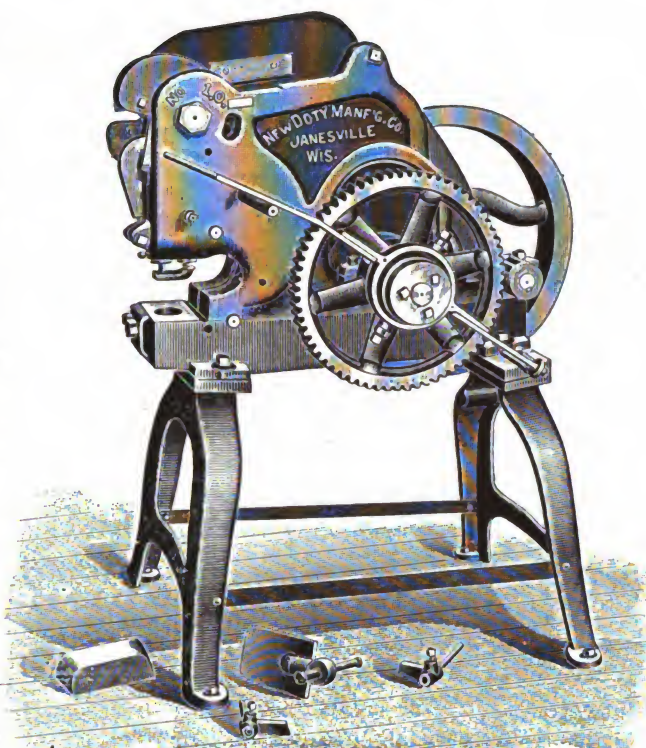
CORRESPONDENCE SOLICITED.



Please mention "The Hub" when you write.

Combined PUNCH and SHEAR MACHINE.

THE illustration herewith represents a line of combined punches and shears made by the New Doty Manufacturing Co., at Janesville, Wis., it showing the smallest size. This machine will punch a ½-inch hole in 5-16-inch iron; will cut a flat bar 1½ by ½ or less, and ¾ round or less. It has three sets of knives, one for flat bar, one for round iron and one for wide metal such as plow makers use. These three sets of knives are entirely independent of each other and of the punch. The knives can be used at the same time as the punch, if desired, or the punch can be idle while the knives are working. The machine is always ready for work, either as a punch or shear, without any change. The knives for round iron are made the reverse of the iron; this prevents the flattening of the iron in cutting, and leaves a round end on the



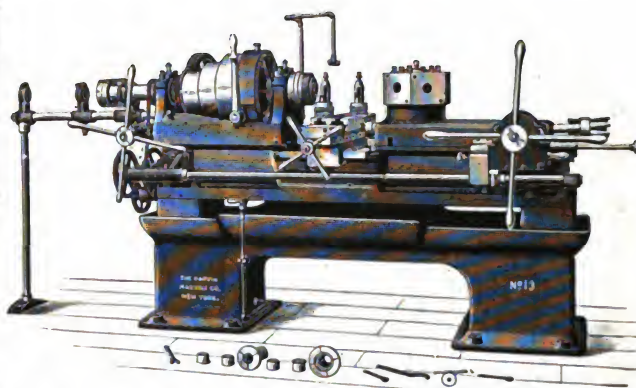
iron. Punches and dies can be adjusted to this machine without stopping the balance wheel. All shafts and bolts and plunger are of steel. The machine is put together in workmanlike manner. It is supplied with the Doty improved stripper, which is adjustable to the one one-thousandth part of an inch; starts with a lever or treadle, and can be stopped instantly, thus holding the punches and knives in any desired position. This machine has been placed in a good many establishments, and any number of testimonials are not wanting to show that wherever used it gives the best satisfaction. It is a machine that stands upon its merits, and its manufacturers solicit for it a trial by those who have not used it. Any further particulars will be most cheerfully furnished by addressing the manufacturers.

**NEW DOTY MANUFACTURING CO.,
JANESVILLE, WIS.**



**THE BEAUDRY
CHAMPION
POWER HAMMER
FOR CARRIAGE, WAGON
AND
AUTOMOBILE
FORGING.**

**BUILT BY
BEAUDRY & CO.,
8 A Oliver Street,
BOSTON, MASS.**



No. 13 SCREW MACHINE, WITH WIRE FEED, GEARED FRICTION HEAD AND POWER FEED TO TURRET.

**THE GARVIN MACHINE CO.,
PHILADELPHIA STORE,
51 North 7th St.
Spring and Varlek Sts., NEW YORK.**

We also are manufacturers of a complete line of machine tools used in the manufacture of automobile and vehicle parts, etc. Our latest catalogue sent free on request.

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TIRE SETTERS.

Valentine Elcoro & Co., City of Mexico,
.....special No. 6
Abbot-Downing Co., Boston, Mass.....No. 4
(This makes the third machine for Abbot-Downing Co.)
Day & Tannhill, Augusta, Ga.....No. 3
American Ice Co., Philadelphia, Pa.....No. 3
American Ice Co., Baltimore, Md.....No. 3
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Davis Wagon Co., Columbus, Ga.....No. 3

Forbes & Bro., Hopkinsville, Ky.....No. 3
Ionia Wagon Co., Ionia, Mich.....No. 3
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Kemp & Burpee Mfg. Co., Syracuse, N. Y.....No. 3
Lansing Wagon Works, Lansing, Mich.....No. 3
Wilmington Wheel Co., Wilmington, Del.....No. 3
Rufus O. Williams, Woonsocket, R. I.....No. 3
Edward D. Martin, Chapinville, N. Y.....No. 3
Robinson Mfg. Co., Freeport, Ill.....No. 3
Mutual Wheel Co., Moline, Ill.....No. 3
Empire Drill Co., Shortsville, N. Y.....No. 3
McFarlan Carriage Co., Connersville, Ind.....No. 3

Frank J. Enger, Cincinnati, Ohio.....No. 3
Pontiac Spring & Wagon Works, Pontiac, Mich.No. 3

HUB BANDERS.

Piedmont Wagon Co., Hickory, N. C.
Geo. E. Nissen & Co., Winston-Salem, N. C.
Lansing Wagon Works, Lansing, Mich.
Forbes & Bro., Hopkinsville, Ky.
Davis Wagon Co., Columbus, Ga.
Hickman Wagon Co., Hickman, Ky.
Troy Wagon Works, Troy, Ohio.

THE WEST TIRE SETTER CO., 105 Meigs Street, Rochester, N. Y.

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MORSE TWIST DRILL and MACHINE CO.,

NEW BEDFORD, MASS., U. S. A.



WE make several styles of drills with holes for lubricant through solid metal. Also Three-Groove Chucking Reamer with holes for oil. These tools are illustrated in our new catalogue, which will be ready for distribution about July 1st. Send us your name and address if interested.

Do you have Trouble
With your Spoke Knives?

IF SO WE CAN HELP YOU.

TAYLOR, STILES & CO.,

RIEGELSVILLE, N. J.

Manufacturers of **KNIVES FOR SPOKE AND WHEEL MACHINERY.**



SCRANTON POWER HAMMERS

J. W. Wright & Co., St. Louis, Mo.
Prentiss Tool & Supply Co., New York.
Chandler & Farquhar, Boston, Mass.
Marshall & Hushart Machinery Co., Chicago, Ill., and Cleveland, O.
Philadelphia Machinery & Supply Co., Philadelphia, Pa.
Chas. Churchill Co., Ltd., London, Eng.

Designed to Reduce the Cost of
Carriage and Wagon Iron Work.

The Scranton & Co.,

Write for Circular. **New Haven, Ct.**

The "EASY" Bolt Clipper.



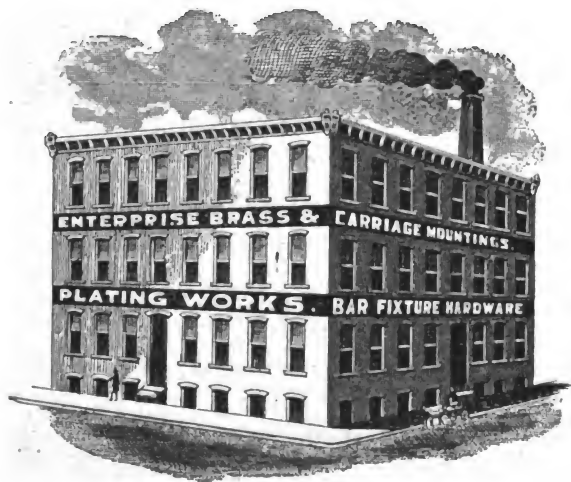
BEST IN THE WORLD.
Send for Circular.

MANUFACTURED BY
H. K. PORTER, 68 Beverly St., Boston.
Over 66,000 Sold.

BROKEN BICYCLES...

are expensive. We sell all necessary tools and materials, and can duplicate any part when piece is mailed to us. Will mail you for 25c. in stamps a practical treatise, "How to Repair Bicycles," by competent authorities, and a fully illustrated catalogue embracing thousands of bargains in tools, fittings and repair parts.

THE FRASSE CO.,
38 Cortlandt St., NEW YORK.



Staples' Patent Springwork

SYSTEM PROTECTED BY SEVEN UNITED STATES PATENTS.



We believe that we have the best and most practical Spring Cushion on the market.

Springs made on this principle have been sold by us to the makers of Upholstered Furniture for the past six years, and hundreds of the leading manufacturers in that line bear testimony to their practicability.

The best and largest Carriage Makers are rapidly adopting our method.

A GOOD SPRING CUSHION IS NOT ONLY A TALKING POINT, BUT A SELLING POINT.

We will be glad to come and see you and bring samples, and will again say this is a good thing and we are sure we can please you.

STAPLES & HANFORD, Newburgh, N. Y.

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SLEIGH COUPLINGS AND CLIPS.

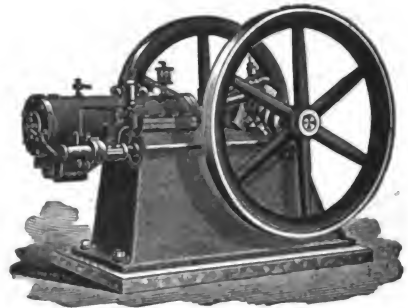


SHAFT COUPLINGS,
KING BOLTS,
AXLE AND SADDLE CLIPS



BOLTS OF EVERY DESCRIPTION.
WRITE FOR OUR 1898 CATALOGUE.

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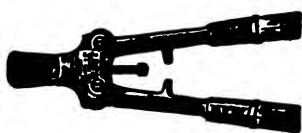
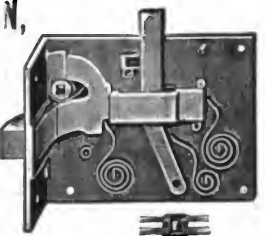
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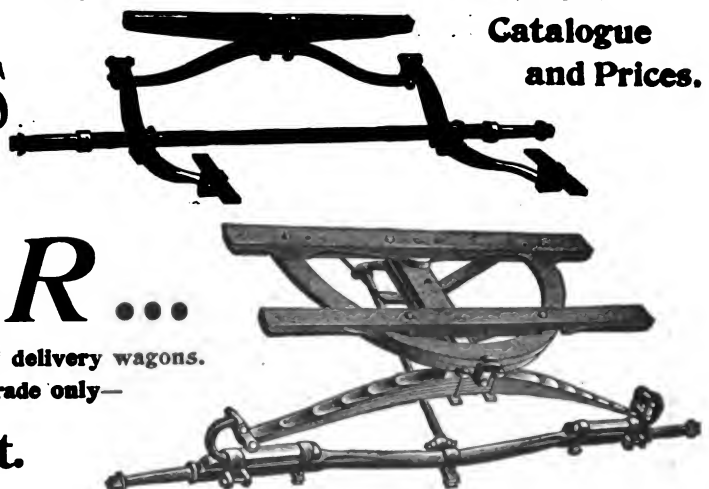
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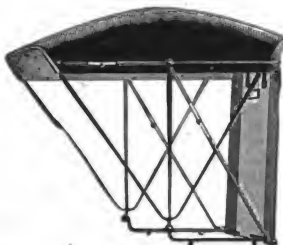
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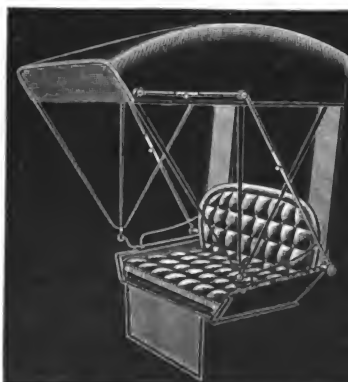
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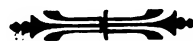
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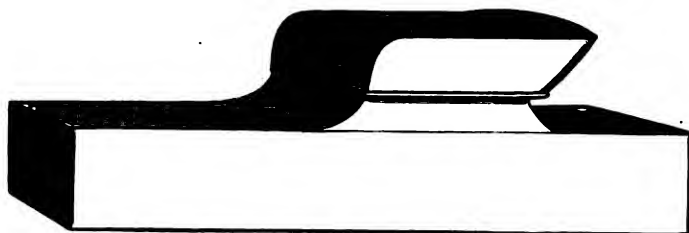
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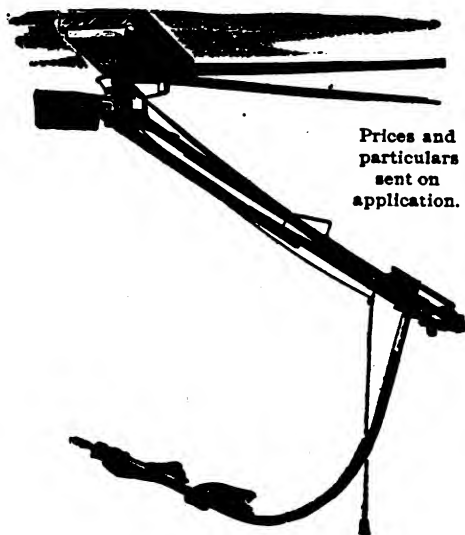
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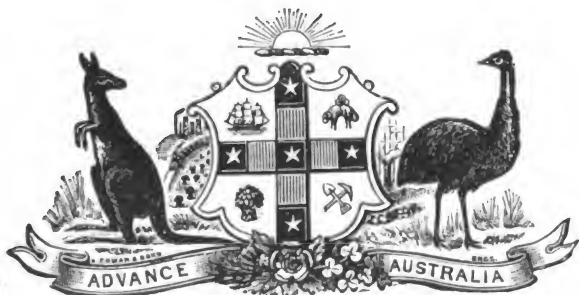
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No. 18.

... NARRATIVES ...

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